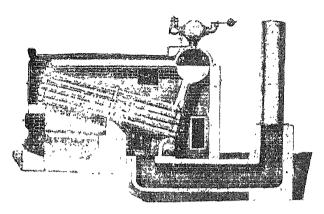
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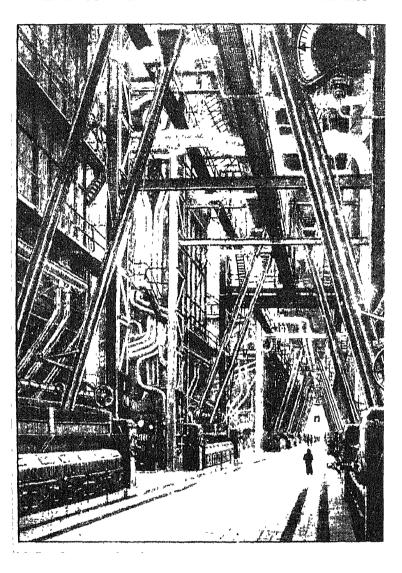
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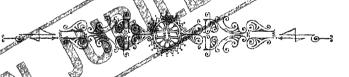
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TRAILE JOURNAL.

A REPRESENTATIVE PUBLICATION

FOR THE

Cextile and Engineering Industries.



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EXPORTERS IMPORTERS ENGINEERS

Fresented personally by the Editor,
Jal Sozatji Rutnagut, to Dr. Rajendra Frasacl
Gresident of India, with a request that this
Volume be preserved in the Archives and
Library of Rashtrapati Bhavan, hew Delhi.

Wednesday, 6th november 1957.

INDIAN TEXTILE JOURNAL

J U B I L E E SOUVENIR 1890-1940

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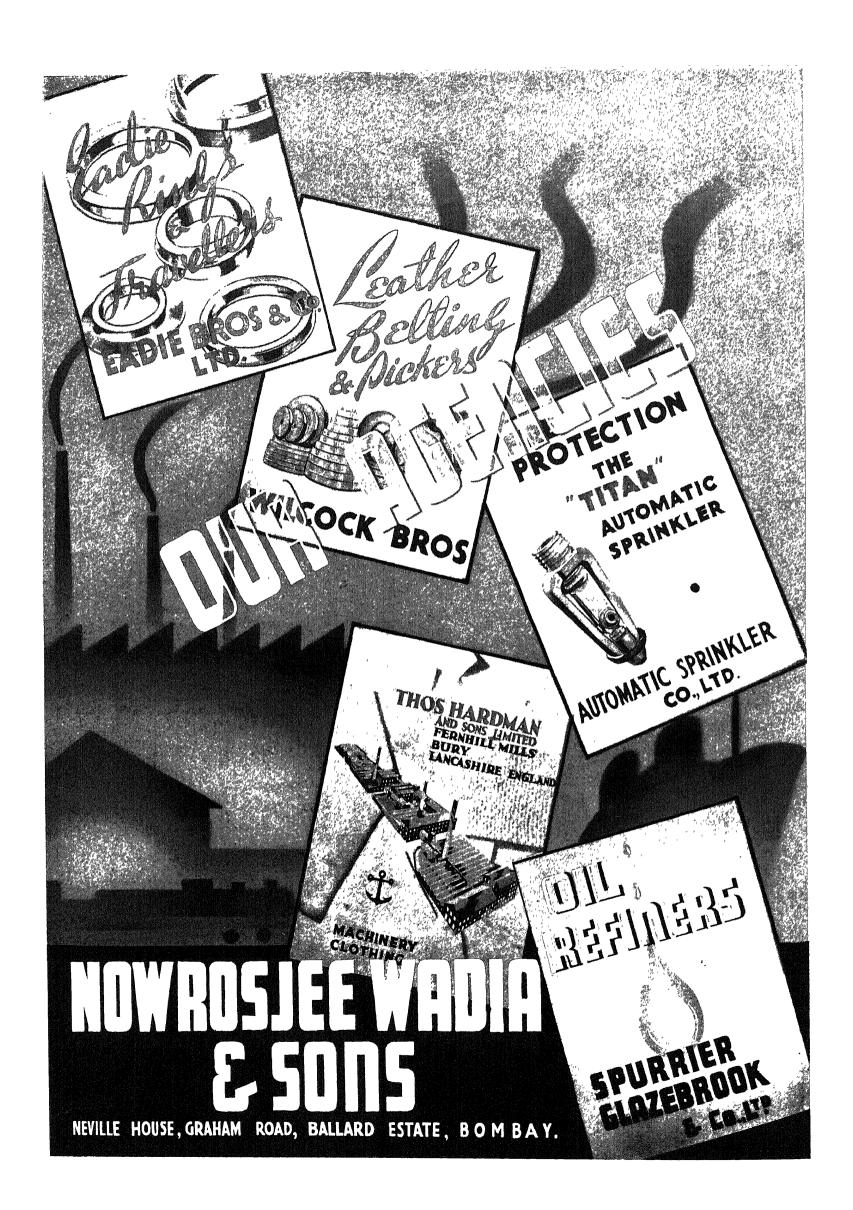
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MAX GENNEIDER

Sorabji M. Rutnagur 1865 - 1937

Founder of the Indian Textile Journal



ITH genuine pleasure and with pardonable pride in the achievements of our first fifty years, we present this—our Golden Jubilee Souvenir—to the reader. The first issue of the *Indian Textile Journal* was out on 22nd October 1890, and the issue for October 1940 therefore marked the completion of its 50 years. The publication of this Souvenir, however, has been delayed by the prevailing war conditions and there is no need for us, we hope, to emphasise the problems we have had to face

India's textile industry has rightly been called the foremost indigenous industry of the country. From small beginnings, over three-quarters of a century ago, the industry has now grown into one of international importance, and, in the prosperity and welfare of India, it plays a great and vital part. From the city of Bombay which has been the home of the industry, it has now spread to the Indian Provinces and States It has a total paid-up capital of Rs. 46 crores while the total cost of block is valued at Rs. 100 crores. It supports more than $4\frac{1}{2}$ lakhs of workers and their dependants, and its place in the World Cotton Textile Industry is second from the standpoint of cotton consumed and fifth from that of spindleage and loomage.

It is this vast national industry which the Indian Textile Journal has represented for fifty long years. The Journal has to-day earned an honourable place for itself in the realm of trade and technical journalism through the enterprise, devotion and self-sacrificing labours of not only its Founder—Sorabji M. Rutnagur—but also all those, including the late Mr. John Wallace, who worked with him in the days gone by. To the revered memory of the Founder and his colleagues we dedicate this Souvenir as a tribute to their pioneering work and steadfast devotion to the cause of our country's textile industry.

As the industry had its ups and downs, we too had ours. However, the representative character of the *Journal* has at no time been seriously questioned; and its prestige has always been maintained by the character of its contributors and the appreciation of its subscribers in all parts of the world. The list of contributors to this Souvenir adds further testimony and is in keeping with the traditions of the *Journal*. We deem it a privilege to publish their interesting and authoritative articles on the different aspects of the industry and we tender our warm thanks to them.

It is fitting that we should remember and pay our tribute to all those, however lowly and humble, who in the past have helped to bring the Journal to its present level of excellence Likewise do we record our appreciation of those who now enable it to maintain its hard-earned reputation. We also acknowledge with gratitude the generous co-operation and support we have always received from advertisers, contributors and readers alike, and confidently look forward to its continuance in ever greater measure in the many eventful years that lie before us.

For us this is an occasion for jubilation. But the note of rejoicing is inappropriate amid the carnage and devastation of modern warfare, amid the suffering and pain that daily and hourly visit many thousands of our fellow human beings in the West and in the East. It is, however, not with despondency that we look towards the future. It is not in that spirit that a shattered world can be remade. Sympathy and understanding, courage and confidence, these should be the watchwords. Bearing these in mind, we hope to devote our energies to the peaceful and ordered development of our country's spinning, weaving, and other industries, for in that sphere our lot is cast.

gal & Flutniger



GOVERNMENT HOUSE, BOMBAY.

23rd December 1940.

I am glad to send to the Indian Textile Journal my warm congratulations on the occasion of its Golden Jubilee.

The growth of India's major manufacturing industry during the last 50 years has been phenomenal and in achieving this result the Journal has played an essential part. It is my hope that it may continue worthily to fulfil its important role for many years to come.

Governor of Bombay.



New Delhi. The 3rd December 18 40.

The Indian Textile Journal has completed 50 years of useful activity and it is fitting that its Golden Jubilee should be celebrated. The Journal holds a unique place among those devoted to commerce and industry and in the special field it has chosen it has no rival in this country. it bears comparison with the best journals of the kind produced in Europe or America. It was founded by Mr. Sorabji M. Rutnagur and the traditions have been so well established that the son, Mr. Jal Rutnagur, is able even to improve upon it and produce a valuable magazine each month. I have greatly profited by the many contributions from distinguished business men which have appeared from time to time in the Journal and I have been struck by the able and unbiased editorials which have been a characteristic of the magazine. I wish the Indian Textile Journal all success in its endeavour to be the spokesman of one of the greatest industries in India to-day.

Mamasmani Mudahai

Message from

THE HON'BLE DEWAN BAHADUR SIR A. RAMASWAMI MUDALIAR, KT., C.I E., Member of the Viceroy's Executive Council, Department of Commerce and Labour.

THE FIFTY YEARS

TOLD FROM THE PAGES OF THE "INDIAN TEXTILE JOURNAL"

N a modest ground floor office in a house in Tamarind Lane, Bombay, sat a young man of 27, a trifle exhilarated at the sight of his first journal leaving the premises. His name was Sorabii Muncherii Rutnagur. It was the 22nd day of October 1890, and Tamarind Lane was also, one felt at the time, a corner of a great Empire over which presided the genius of Queen Victoria. That was the outlook of the era from which has emerged the Indian Textile Journal. The 50 years that have passed since then have seen a transformation in thought, in style, in ideals and outlookproviding for those who have grown up with it and those who wish to look back into the past, a fascinating panorama of rapidly moving events, syncopating in rhythm with the great machines which have never ceased moving —the engines, the cards, the spinning frames and the looms-machines and men who have grown in stature, in power, in output, and even in ideals.

The first editorial says:-

"In a great manufacturing country like India the absence of such a journal has been much felt. The objects the proprietors have in view are (1) to establish a representative organ for the textile industries, (2) to possess a journal of sound and wholesome literary matters, and (3) to create a valuable medium for advertising purposes "

Such was, in brief, the promise held out—a promise which, one feels, has been more than faithfully kept and which, those who have worked on it can say, has been fascinating to keep.

This early volume which was printed in blue ink on a two-column page and came out on the third Wednesday of the month carried with it the hall-mark of the period—the flourish of the Victorian era, the pomp, the dignity, even some of the awkward self-consciousness. Every article is crowned as it were with an ornamental block—a decorated drop-letter—reflecting the desire to accentuate the flourish.

The literature of the period is also somewhat heavy; though retaining an innate desire for sincerity, there emerges from it a sense of values, which conflicts with that which is acknowledged to be correct to-day. A series is started in this first number, "Men of Industry," with Sir Dinshaw Maneckji Petit, the first Baronet, decorating the number with his picture grafted into the middle of an written life-sketch—an gentleman with snow-white hair, a Parsi long coat, paghri, an ample moustache and locks that came well down the sides. A modest sort of a Victorian Parsı gentleman sıttıng at ease on a chair, his hands grasping each other, giving an impression of perfect poise -dignity recollected in serene tranquillity.

We turn the pages. "Factory legislation" is a caption that recurs time and again. In the form of questions and answers are discussed various forms of factory legislation—the sort of reformist attitude which might well have been taken by the great champion of that time—Sorabji Shapurji Bengalee. Moderate in tone, it discusses the problem from the view-point of Capital and Labour No Communist would be comfortable wading through

It—its tone is so mild, and so gentle, and there is a constant emphasis on the golden mean—the hall-mark of that period.

"The Men of Industry" go on—Cowasji Nanabhai Daver, the Hon. N. N. Wadia, Mr. George Cotton. Of the last named it is so innocently said, "He is a born Irishman, although being educated in England, and an Anglo-Indian for 30 years, his native country has now but little claim upon him." Those were obviously the days when that now odious word "Anglo-Indian" had a gentler meaning—significant of a coming fusion of two cultures and two peoples—a fusion that has slightly been "combusted."

We get somewhere a glimpse of a mill operative—his life, his work, even something of what was then his future, but often there are lapses in discretion and we have some rather realistic passages as these.

"As the workman leaves his home at sunrise, he has had no time to manage a shave; he has, however, not far to go for it. The manager generally allows a shaving monopoly to the barber who by the way may have been recommended by the head cook in the service of the master of the mill. A small shed being provided for him in the corner of the mill compound, the *nhavi* or barber does a roaring trade. The shaving operations are not performed on the chin alone, the custom requires a clean shave all over the head and face, wherever there is a hair, save the lock of hair in the centre of the scalp and moustache. About half a dozen customers may be waiting their turns till scared away by the appearance of the master."

That same article goes on to expand on the character of the millhand. That para is still as true as it ever was—the remedy suggested is equally necessary to-day.

It runs :-

"The want of education is everywhere painfully apparent, while the antipathy to cleanliness is almost beyond imagination. They are not honest, but they are even less truthful than honest Lying is not lying with them, it is merely a clumsy perversion of facts. Their want of intellect prevents them from raising it to the delicacy exhibited by the educated native and the European. A workman will ask leave to attend the funeral of his mother over and over again, and unless detected he would go on burying his maternal relatives with unvarying regularity month by month in the interval of the control of the saily moulded. It can be bent or swayed backward and forward without difficulty, but, whenever the guiding force is removed, it invariably returns to its original form. This is the great drawback to Indian progress, and it cannot be removed except by education."

One of the most striking things about these early numbers is the quality of the printing, the woodcuts, and in some places beautifully reproduced pictures. These were a novelty in those days and in many cases the blocks were imported all the way from England. England—then a far-off and distant place which only time has helped to bring nearer. There is something of that atmosphere of distance reflected in the early articles, whose purpose was to bring home to the Indian industry some of the salient features of the working of the mills in Lancashire, the

development of new ideas, the types of new machinery, all of which are to-day on our shores. In the development of the Indian textile industry, this Journal has during 50 years of unstinted labour played a part which cannot easily be overlooked A thousand questions had a thousand answers and every month when the paper came out the answers were read with respect by those who glanced through its pages. These questions and answers told the whole story of textile manufacture

"Question 145—What causes "nep" and what is its appearance under a high

microscopic power?

"Answer—Nep may be either artificial or natural. If the former, then it is caused by some fibres of the cotton having got broken and crushed. It shows as such under the microscope. Natural nep is unripe fibre which has contracted by the heat. It presents the appearance under the microscope of a thin, transparent filmy ribbon, without body or thickness."

1891 comes on the calendar and a new bound volume is about to begin There are traces of small changes in evidence, like the date of publication and the removal of the ornamental tail-pieces making room for more letterpress. The Journal brings out a special supplement dealing with the 2,000 hp. compound engine of Messrs Musgrove & Co., which is installed at the Oriental Spinning and Manufacturing Co., Ltd., Bombay. The colour of the title-page is changed in October and towards the end of the year the Journal has a new and more imposing address-27, Medows Street. But its characteristic tone remains much the same. There are signs of its having found its stride. There is an easier tone in its editorials-one gets a feeling of confidence, of achievement that stands in the background, adding spine to the whole body. Its seriousness of purpose is everywhere to be seensometimes a little too ridiculously pompous. There is a classic photo of four young men in Parsı cap and paghrı—all rıgıdly to attention with a short undergrowth of black beard to tone them up. This photo is part of an article on "Technical Education" and the young men represent the first students of that institute. Their names are Jehangir B. Golwala, Isaac A. Telegamker, Cursetji N. Vevai, Mowji K. Porecha. With the exception of Golwala some of the surnames seem to be extinct to-day.

Capital and Labour seemed to have pulled on better than they do now. A small para reads:—

"On the 7th instant (it is January 1892) the Director of the Savana Mills, Pondicherry, presented each of his employees half a month's pay and this is not the first time he has generally given a donation as a New Year's present."

"The Men of Industry" series goes on. August 1892 tells us about Sorabji Shapurji Bengalee What a fine figure of a man he looks with mutton chop whiskers and a C.I.E. emblazoned on his manly chest, imposing, high-spirited, high-minded! Those were the days when this little community was proud of its leadership and when clean, honest thinking was the order of the day. It is refreshing to

look back into those pages of an industry's and community's history.

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The internal affairs of the Journal must have a word. It is decided to preserve catalogues and other literature in the office for the benefit of inquirers—perhaps the first depository of technical knowledge in this country. The new volume registers a change of cover. Some mention is made how the Journal could not accede to the request to reduce its advertising rates. Quality was a hall-mark it has always tried to retain

4 **

In 1893, sometime towards the middle of the year, Hugh Monie retires from partnership and the business is renamed M C. Rutnagur & Co, Proprietors and Publishers, Indian Textile Journal Ltd. The Journal appears with 30 pages in October and photo zinco and electro blocks make their first appearance.

* * *

The ink by now has become black. There is a greater simplicity of style. The flourishes have gradually faded away. Two whole years have elapsed since that day in October 1890 and one feels conscious of the acquirement of a status. The *Indian Textile Journal* has got a foothold in journalism—a foothold in the industrial section of the country.

News from abroad is concise but clear.

"The lock-out in the Lancashire cotton trade has commenced. About forty thousand workpeople are directly affected." "For the past ten months of the year the export trade of Great Britain has fallen off by the enormous amount of 90,000,000 pounds."

Not imperial preference then? No ways and means of shifting the blow to other Empire countries?

There is a series started in lighter vein. Sometimes that humour is so dry it has cracks in it. There is a story of a Scotchman and his dhootie. (Note the word "Scotchman".) It reads:—

"An old canny Scot was examining the cloth on a piecegoods stall in the bazar, and felt rather bored with the persuasions of the dealer who was trying to impress him with the superior qualities of his stock over that of his neighbours. 'Ay! ay!' said the Scottie, 'your claith is guid I've nae doot, eh! but I dinna want tae buy.' 'Sahib got no dootie' replied the dealer 'I give sahib dhootie.'"

I have no doubt in my mind this story is good, but somehow I seem to miss the point.

In a more serious vein is an article written specially for the Journal on small industries in India. To-day that article may seem of trifling importance but, when you bear in mind the date and the year, you begin to wonder why it has taken so long for this country to realize the scope it had to foster new industries. The Indigenous Industries Commission which came some two decades later did not say much more than is said in this five-column article in the Journal in 1892. Perhaps there was a latent, inherent, commonsense among those whom we in our arrogance and impetuosity regard as a fossilised generation. But looking back on it now one feels that there was a sound substratum of thought way back in those nineties which we find missing in the generation of to-day. This article mentions a number of small industries—hinges, brass bolts, hooks, nails, drawer handles, wire working, stamped brass and tin hollow ware, bamboo furniture, lock and padlocks, keys, and a hundred other things. A passage from it shows the simplicity of the writing-that complete absence of verbiage.

"The Indian-made key lacks finish on its working surfaces, which being irregular and rougher than good English ones, do not last so long. This is a point that the Indian can, and must, improve on. He must spend a little money on good tools, or contract with a European maker for a supply of good keys to which his locks must be fitted. He must learn to use the fly press, and have standard sizes for drills and punches. His brass founding must be as perfect as he can make it, and his cuttings must have just the amount of spare metal to clean up. There is room for a good deal of ornamentation on the cases of brass locks that should commend itself in the native markets. The introduction of floral or other decorations, combined with proverbial expressions as in old German work, offers an infinite variety of devices. There is so little hand labour on cheap iron locks of European make, and so much that is done by machine, that there is far less room for Indian competition in making them than in making brass locks. The latter ought, in good hands, to flourish, even to the point of an export trade to neighbouring countries. Cheap safes are already made in such quantities in India as to seriously reduce the imports of those of European manufacture. Although burglary is common enough, and thieving a high art, the Indian criminal is not clever at opening safes, and a very inferior one is a sufficient protection against him.

This article, contributed by Mr. D. F. Karaka, gives an idea of the fifty volumes of the Journal and of some of the outstanding events of half a century. His reading of events is perhaps different from ours, but, nonetheless, it is a fair, though sometimes critical, review of our past.—ED.

Few, if any, of the Indian safes are really fireproof. We doubt if any single example would bear the tests applied at public competitions in Europe where the safe, after supporting a very fierce fire for some hours is lifted and dropped from a considerable height upon a stone-paved floor."

* * *

"Foreign news" gives the world cotton situation in a nutshell:—

"In painful contrast to the state of affairs in Lancashire, we have the bright side of cotton spinning success in America During the year just ended 19 concerns at Fall River with an aggregate capital of 12,010,000 dollars, have declared net profits amounting to 2,044,089 dollars or some 17½ per cent. In addition to this, unusually large sums have been spent on improvements of plant and deducted from revenue. If we take another view of the matter, the result is still more striking. The 19 concerns in question own 1,362,310 spindles, so that the profits average 1½ dollars per spindle per annum, which is equal to a Lancashire mill of 100,000 spindles earning a net profit of £30,000 in the year. So prosperous are the Fall River mills that the employers are reducing the working hours from 60 to 58, and also raising wages 7½ per cent. making a total advance of 10 per cent., at the very time when the Lancashire mills are

weighed down with adverse balances, and in the midst of a struggle to reduce wages "

7 7

Labour troubles were not infrequent even in those days. A note on a lawsuit by a mull-hand says:

"A strike mania seems to have been present lately in connection with the Bombay cotton mills."

The case referred to was Gunput Sewram and the Sassoon Spinning and Weaving Mills. The suit was filed by the millhand for recovery of wages. The defendants contended that under a certain rule of the defendant Company, the absence of the millhand without notice had made him forfeit his wages. His Honour held for the defendants and the suit was dismissed. And then begins the more interesting part of the story—where Labour took the law in its own hands. This is what the Journal's report says:

"About 400 millhands of the Sassoon Mill, who were on strike, collected in the precincts of the Court, anxiously waiting to know the result of the abovementioned suit, which was brought as a test case, and when they were informed of the result of the proceedings the strikers apparently got irritated. On the Mill Manager, Mr. Perozshah Bomanjee Jeejeebhoy, who was accompanied by Mr. J Heap, the Weaving Master, and the timekeeper of the Millhands named Ardeshir, leaving the premises of the Court, the whole gang of men pounced upon the manager while getting into his carriage, and demanded the immediate payment of their wages, and threatened to molest him if he did not comply. The manager made an attempt to pacify the men, but they became very furious, and some of the gang assaulted Mr. Pherozshaw with sticks, inflicting a nasty cut on his forehead and dragged him about, and his turban fell off..."

Likewise the consciousness of rights seems to have dawned on Labour when, at a mass meeting of millhands held in Bombay on the 15th July 1893 for the purpose of considering the question of recommending a member to represent them in the new Legislative Council, two resolutions were carried "with acclamation":

(I) "That in the opinion of this meeting Narayen Meghaji Lokhande was never elected or appointed the representative of the millhands of Bombay, nor was anybody authorized to elect or appoint him as such'; and (2) "That in the opinion of this meeting, the Hon'ble Mr. N N. Wadia is a proper person to represent the millhands in the Legislative Council."

* * *

News regarding the internal affairs of the Journal shows that Hugh Monie has retired from partnership in the August of 1893. John Wallace is appointed Editor of the Engineering Section

* *

Somewhat striking is a note on Japanese "patriotism". One can hardly believe that this remarkably modern piece of writing could be found in a journal of the nineties. It reads:—

"The Japanese Cotton Spinners' Union has, says the Eastern World, bound its members not to buy any cotton that is not imported in the steamers of the Bombay line of the Nippon Yusen Kaisha, fixing a penalty of \$3 per bale if any member violates that agreement. The Manichi also asserts that the Union has endeavoured to persuade foreign importers to join the boycott of cotton imported by P. & O. steamers, but these perverse people, it seems, cannot see quite so far as the

Union, and have not only refused to entertain the proposition, but on the contrary, taken sides with the P & O Co We must confess we have but little confidence in the business ability of people who at the slightest provocation have to resort to the questionable means of a boycott, whom a morbid sense of sickly patriotism prevents from looking at business matters from a business point of view, and who will not benefit by the of view, and who will not benefit by the experience of even their own people "
—witness the Japan Iron Foundry muddle. Mr. Masuda who took a common-sense view of that question when it first came view of that question when it first cante up was the subject of a murderous attack, and a Tokio patriot sent \$50 to a band of soshi in Mita, Tokio, enjoining them to impress the duty of patriotism on the City Council, that is in plain English, to cut the members down if they took a business view of the matter But the same patriots have not a word to say now. The cotton patriots, too, seem to be afraid that some amongst their members should conceive the heretical idea that freights must be left to find their own level, for otherwise they would not have stipulated a penalty, and, as a rule, our Japanese friends need not be bound by penalties to do the thing that is good for them There is an Ethiopian on the fence somewhere. But the Japanese are never satisfied unless they buy their experience in the dearest market—the only condition is that the vendor be a Japanese—and we have no doubt but that the Cotton Spinners' Union will also that the Cotton spinners Union will also lay in a stock of that commodity, and of an expensive quality too. Then, when the cart is mired, the Government will be appealed to. The next Diet should provide for a special fund for the purchase of experience—the very babes on their mother's backs would subscribe to it."

The Journal begins its fifth year with the feeling of having done four good years of work. The Times of India said:

"Indian readers are content to draw their scientific inspiration from home journals, but it is quite possible, even in the arts and manufactures, that local conditions are often present which cannot be overlooked by textile manufacturers. and engineers In its leading and correspondence columns the *Indian Textile Journal* draws largely upon Indian experience to elucidate Indian problems and deals with its subjects in a true scientific spirit. This, indeed, is the reason for its existence, and it is this speciality which will secure for it a wide circle of readers.

The Bombay Gazetteer

"The style in which the periodical is issued to the public entails a heavy outlay, but we are glad to see that the efforts of the publishers are appreciated, and a really useful and interesting journal is helped to circulate in a country which is daily growing in industrial and commer-cial importance "

By now too we get used to a featured article which appears regularly and is called "Mr J. Jamasjee's Yarn and Raw Cotton Report''. It is in the form of a letter from Hongkong. Mr. Jamasjee continues month by month to send his report from Hongkong. Who was this man Jamasjee ? What became of him ?

All of a sudden in May 1895 comes a shocking article as first leader headed "Morality by Act of Parliament". It is, believe it or not, by the German Parliament. The word "shocking" is, therefore, appropriately used

"The German Government," this leader begins, "has at present under consideration, a project of law, which, if carried out in the form proposed, will have effects more remarkable than those of any earthquake. It is nothing less than an act to put an end to dishonest methods of doing higher the state." of doing business, alike in the manu-factory and in the merchant's office "

"Dishonest methods of doing business!"

How that sounds in our ears when to-day everything that is Nazi would qualify to be low and mean and dishonest It is difficult to believe that there ever was an Act of Parliament or even a Parliament in that country now defiled by the greed-lust of Adolf Hitler But 1895 is a long time ago—if only those days would come back to Germany.

Ouite the most astonishing article appearing in the Journal since it first began is on "An Outrage by mill-operatives in Russia." It was, you must remember, the Russia of the White Tsar, the Russia of St Petersburg, not the Russia of Karl Marx and Lenin and Trotsky, not the Russia of the people. The following extracts from the article throw some light on that spirit which was later to bring out the revolution .

" A serious outrage has lately occurred in connection with one of the cotton mills in Russia, and apparently from most madequate causes

The victim, Mr Joseph Crawshaw, who had been for fifteen years manager of the mill, had some dispute with his work-people, the exact nature of which may possibly never be known. The alleged cause of complaint was the enforcement of excessive fines, but the local Police Inspector who was called in, investigated the books and found that the fines had not the books and found that the lines had not been rated on an unreasonable scale. This he explained to the operatives. Nevertheless, on Mr. Crawshaw leaving the mill at noon in company of the Inspector, he was, without a word from the mob, knocked down by one of them with a large piece of wood. As soon as Mr. Crawshaw got up he was again struck by a strong which cut his face over the contract of t struck by a stone, which cut his face open. In spite of his wounds Mr. Crawshaw, In spite of his wounds Mr. Crawshaw, after firing two shots from a revolver amongst the crowd, managed to gain his house, and with his children and two governesses (one English and the other German), reached the upper storey, while the mob took possession of the ground floor, smashing to atoms everything they could find, except the contents of the wine-cellar, which they consumed. Then two of the leaders went upstairs, one with a crow-bar in his hand, and the other having a brass pan on his head as a one with a crow-bar in his hand, and the other having a brass pan on his head as a helmet. Mr. Crawshaw, after warning the men not to approach, shot both dead He also succeeded in seriously injuring five others. It will scarcely be credited, but these brave folks, Mr. Crawshaw (bleed-man proposition) from his proposition of the propos these brave folks, Mr. Crawshaw (bleeding profusely from his wounds) and the two young ladies, stood at the top of the stairs for four hours keeping the crowd at bay Eventually the policemen induced Mr. Crawshaw to go outside on the pretext that the people wanted to speak to him, when they at once treacherously knocked him on the head, and killed him on the proful The Program a head the state of the proful The Program a head the state of the proful The Program a head the state of the proful The Program a head the state of the program and the state of the state o on the spot The Russian policeman quietly stepped over the dead body, leaving the governesses and children to their fate.

For the leading facts in connection with this tragedy we are indebted to the columns of the *Oldham Chronicle*, but, as that journal explains, it was with the greatest difficulty that authentic information had been given even by the relatives of the deceased. This often happens in Russia, which its Government thinks calculated to throw doubt in the minds of other European nations as to its claims to be included amongst those recognized as civilised, its standing orders to its officials are to suppress the news by every possible means. The *Chronicle* only repeats what is the experience of every foreign traveller in Russia, that letters whether of a private or business character are promiscuously opened by the Government censor or his deputies, the contents of English journals 'blacked out', even Tenniel's cartoons in *Punch*, if bearing any reference to the 'White Tzar,' are mercilessly smeared, however harmless they may be.''

The last para is perhaps the most important. It is in its way a strong condemnation of the

methods of the Tsarist regime. It shows the impotency of the department of law and order. It shows that the Government of Joseph Stalm is perhaps more reliable and more constitutionally-minded than the Government of Nicholas, the Tsar

January 1896 has an article on "What Boys Should Know"! Mr. Jamasji seems to have disappeared

Mr. Monie severs connection with the Journal The Journal decides to publish a vernacular edition on the 20th of each month The English edition now appears on the 15th.

1897 is a black year because it brought with it the bubonic plague. Labour suffers intensely and there is a general depletion among the ranks of working men. In an editorial comment the following interesting remarks appear:

"It has probably not occurred to many of our readers to think what might have happened had the halalcores been athappened had the halalcores been attacked by the plague, and how much the safety of the city depends on their services. We had in 1893 a memorable illustration of how in times of civil disturbance, our whole conservancy arrangements could be dislocated by a religious dispute between Mahomedans and Hindus It was then evident for the first time that the sewerage system was only effective so long as it was supplemented effective so long as it was supplemented by the labours of these halalcores Without them the removal of sewage came to a practical standstill The present time offers an occasion to recognize the work of the *halalcore* to improve his position and to get very much more work out of

Dr Ambedkar would probably feel happy to know that even in 1897 there was a journal which spoke of injustice to the depressed classes

D. E Wacha, later to become Sir Dinshaw, writes from England. It is the letter of a man impressed by all he sees. His feelings are represented in one line:

"One can well understand, I repeat, the source of England's greatness after he has seen these colossal establishments"

It was Dinshaw Watcha, the Liberal, the moderate, the believer in this Raj that was speaking.

It fell to the lot of a Sanıtary Commissioner to deliver the convocation address of the Madras University. His name was Lieut -Col. W. G. King, M.B. Says Commissioner King:

"Are you content in a country where the majority of the people wear cotton clothing, and suitable grass is to be found, to accept imported paper? Where fluxes and glazes are available, to import your stoneware and glazed pottery? Must you look to Japan for your supply of matches—a country that within the memory of this generation devoted a few square yards of a single port to European trade, and would not accept the advantages of international commerce till it received half an hour's teaching of what the resources of civilization were at the cannon's mouth at Simouasaki? Must you import from foreign countries the sheets of brass which you use for your domestic vessels? In a country that has no stint of fibre, must we ask for a piece of foreign-made twine before we can be quite sure a parcel is safe? Must even the glass of our windows saie? Must even the glass of our windows and our bottles be of foreign manufacture? Will you leave untouched the 60,000 horse-power available at the Penyar Works, or the riches obtainable from the phosphatic deposits in Trichinopoly, and not dare to enter a trade on which the Americans have embarked many million dollars successfully?"

WHAT OF THE FUTURE?

Bv

Sir H. P. MODY, K.B.E.

THERE is appropriateness in contributing an article on the textile industry to a journal which, in the course of its fifty years' existence, has ably and faithfully served the cause of the industry, and from whose pages may be gleaned the history of its progress and vicissitudes down the long vista of the years.

At the beginning of the century, there were in the whole of India just 40,000 looms. That was a period when she had a substantial export trade in yarns and an import trade of considerable dimensions in cotton textiles. Indian mills clothed but a small proportion of the teeming millions of this country. To-day the position has been practically reversed—the export trade in yarns has largely shrunk owing to the loss of the old China trade—but the country is in a position to supply almost the whole of its requirements of cloth. A stage has almost been reached when any further expansion of production would find itself up against an inadequate home demand.

The war has, for the time being, changed the outlook and opened out possibilities in a number of markets where, for one reason or another, India could make little headway in the past. A somewhat similar situation prevailed during the last war, but, both from the point of view of productive capacity and the types of goods turned out, we are in an infinitely better position to-day to cater to the demand which has sprung up. The Eastern Group Conference is examining the question from the point of view of the military requirements of the Empire, but it is to be hoped that the opportunity provided by the presence of so many representative delegations from overseas will be utilized to the full to discuss the potentialities of this country for supplying the normal civilian requirements of those markets which it can easily reach out on account of its exceptionally favourable geographical position, so that something of abiding value may accrue as a result of the deliberations now being conducted at Delhi.

The problem of the future must largely be the reduction of the costs of production. We have 350 millions of consumers, but on account of the grinding poverty of the vast mass of them, the consumption per head of population remains at practically the same low level at which it stood a quarter of a century ago. The Indian, on an average, spends less than Rs. 4- per year and consumes from 16 to 17 yards of cloth, while the per capita consumption of Great Britain and Canada is twice and that of the United States four times as much. Even an Asiatic country like Japan consumes a great deal more. It would be too much to hope that any really substantial improvement can take place in the economic condition of the agricultural population within a measurable distance of time, and industrialists in this country would be well advised to keep that fundamental factor in mind in estimating the capacity of the country to absorb the products they manufacture.

The problem for Indian industries, therefore, resolves itself mainly into one of greater efficiency. Indian labour is commonly supposed to be cheap, and if wages in terms of money were alone taken into calculation, there would be justification for the belief. Judged, however, in their relation to a given unit of production, wages in India are definitely high, compared to those in countries against which she must compete. The first condition of further progress must therefore be an improvement in the efficiency of labour. A good deal has been done in the last few years in this direction, but in many parts of the country a deplorably low standard prevails, for which neither the climate nor the comparatively poor physique of the workmen provides a sufficient justification. In this connection, one cannot but comment on the activities of some of those who have assumed the leadership of Labour, and who are seeking merely to exploit it for political and personal ends. Industrial disputes in this country have assumed disastrous proportions and, while it must be admitted that the attitude of some employers has been unthinking and unsympathetic, the responsibility for the enormous loss which the worker and the industrialist alike have suffered must largely be laid at the door of a particular type of labour leaders who have acquired control over the working classes Measures for the prevention and settlement of trade disputes have been introduced in several Provinces, but the problem of the cultivation of happier relations beween Capital and Labour will not be solved, except by patient effort and mutual goodwill. Legislative interference, if it is too drastic, is bound to defeat its own ends.

The future of the industry must depend upon a number of other factors. It must be protected in the home market against the penetration of cheap Japanese goods produced under conditions which can never be established in this country. It is not a reflection on the Indian industry that it requires this protection. Producers in even advanced countries have found themselves helpless against the inroads of Japanese manufactures and, while it must be admitted that the Government of India have adopted in recent years a helpful and realistic attitude towards the problem, it cannot be said that sufficient has been done to safeguard the Indian industry in the national interest.

The directions in which the industry can help itself by a long-range policy are several. It is a matter of satisfaction that heavy chemicals will now be produced in this country on a commercial scale. It is essential that an early beginning should be made in the manufacture of dyestuffs and machinery also, in order to reduce our utter dependence in this respect on European and American markets. We are to-day in practically the same position as we were in during the last war, and it is time we looked ahead. India also needs to grow more long-stapled cotton; the efforts made in this direction in the last few years have yielded very encouraging results. This should help not only to reduce our dependence on (Continued on p. 17)

THE INDUSTRY IN RETROSPECT

Вv

Sir NESS WADIA, K.B.E., C.I.E.

Y recollection does not take me back to those early days when the foundations of the Bombay cotton textile industry were well and truly laid by our forefathers, but I do remember hearing of the boom which resulted from the American Civil War of 1861-64 and the crash which occurred later and forced several reputable firms into liquidation. It was some time before normality was restored and, for a period of about 20 years, there was peace and prosperity in the industry, and in this period several mills were put up in Bombay.

Trade conditions were none too good in the nineties. Firstly, there was a series of strikes in individual mills—the first of their kind—in 1892. Mints were closed to the free coinage of silver in 1893, and the dislocation enforced between the silver and the rupee not only killed the hitherto profitable Chinese yarn export trade, but also made it impossible to finance past commitments as banks refused to buy bills on any condition whatsoever. Then came the Cotton Excise Duty of 1896 which further crippled the Indian industry.

The loss of the Chinese yarn trade brought about a material change in the character of the Bombay mill industry which was hitherto a predominantly coarse yarn spinning industry, and more looms were installed in the period 1900-10 to turn the excess yarn into cloth. The development of the weaving section of the industry was not accomplished on a well-planned basis; it was just the case of each mill solving its difficulties by turning more and more of its yarn into cloth. The question of the disposal of this cloth was not perhaps so difficult then as it is to-day, as internal and external competition had not commenced to depress the market The Japanese industry was in its infancy and Japanese competition had not become the menace which it did later, though its influence had been anticipated. Then came the war of 1914-18, which seriously curtailed cloth and yarn imports into India from the United Kingdom which was supplying more than 50 per cent. of this country's requirements in the shape of cotton cloth. Here then was the opportunity for Indian mills; it also gave the opportunity to Japanese and Chinese mills to enter the Indian market by supplying cloth. For a period of five or six years, large profits were earned and mill-share values rose to fantastic heights. Any extensive development of the industry during the war was out of the question as the great textile machinery firms of England were heavily engaged in the manufacture of armaments and munitions, but on the cessation of hostilities there was a rush for new machinery, and large orders were placed at peak prices in expectation of huge profits. Mills which changed hands at about this time fetched very high prices. The boom lasted for a period of four years after the end of the war and provided a very good opportunity to mills to consolidate their position, but few were far-sighted enough to take full advantage of the situation, and when depression set in, several mills

found themselves financially and physically unable to adjust themselves to the altered conditions of trade. The United Kingdom strove hard to retain its pre-war share of the Indian market, and Japan tried by every means possible to obtain a strangle-hold upon it Japan, aided by cheap labour, double-shift working and efficient methods, was able to sell at cut-throat rates and her sales in India depressed prices to such an extent that the manufacture of cloth became an unprofitable proposition, and the provision of adequate depreciation on buildings and machinery was out of the question for most mills. Only the mills which had built up a strong reserve position managed to pull through the crisis; a good number succumbed. Government at this stage were asked to protect the industry against Japanese competition, and the Noyce Tariff Board was appointed ın 1926.

Bombay Mill Merger Scheme

One of the reasons why the post-war depression hit Bombay so hard was the unbalanced position of the various mills comprising the industry, which had been converted piecemeal from spinning to cloth manufacturing. The problem was not so acute in other centres of the industry like Ahmedabad, where most mills had always done both spinning and weaving. The mill merger scheme which I, in conjunction with some of my friends, attempted in 1929-30 was really designed to organize Bombey mills, or as many of them as possible, on the lines of the Japanese cotton industry, and to give effect to the remedial measures suggested by the Noyce Tariff Board The merger aimed at standardization and specialization of production, avoidance of duplication of work and elimination of uneconomic machinery and a joint and central board to deal with purchase of cotton, machinery, sale of waste, yarn, and cloth, etc. Each mill was to be valued and taken over by the merger corporation in return for fully paid shares in the corporation. The preliminary work in connection with the valuation of individual mills of the merger was done by an expert specially secured from England, but the main proposal was ultimately abandoned, as some of the companies refused, in view of the funded debts of the mills under their charge, to hand over the assets at the price fixed by the expert. The failure of the merger was a misfortune, for it would have immediately saved at least seven mills of the merger which were in the next year or two scrapped or taken into liquidation. Six or seven years of continuous losses with three long strikes completely broke their backs, but they sent a warning signal to other mills, and between 1930 and 1940 individual units, under the inspiration of the Millowners' Association, Bombay, adopted, to a considerable extent, the measures for rehabilitating the Bombay cotton textile industry suggested by the Noyce Tariff Board. The output of medium and fine count goods was increased, and this relieved the tension at the coarse end of the production; greater quantities of bleached, dyed and fancy goods were produced, and a number of mills took to printing.

These improvements in production could not have been achieved without a thorough overhaul of the existing machinery and if Government had not granted a measure of protection to the industry Measures to improve the efficiency of the workers were planned and carried out, and wherever possible, i.e., where conditions of machinery and yarn or cloth produced permitted, efficiency measures such as two sides per spinner and three or four looms per weaver were introduced. A certain amount of specialization in production has also been achieved, but there is a limit to the extent to which such specialization could be advanced in individual units. Side by side with these improvements drastic financial reconstruction of mills was also taking place, as a result of which the managing agents and shareholders lost heavily Above all, the selling organization of individual mills was thoroughly reorganized, and to-day most of the mills are directly represented practically in every marketing centre in India.

The Future

With these improvements in our organization, I feel that we can face the future with confidence. The war has opened up enormous opportunities for us, particularly in Africa, the Middle East and the Far Eastern countries. Indian mills supply more than 60 per cent. of this country's cloth requirements, and in view of our commitments with England and Japan, this figure cannot perhaps be improved. Double-shift working has become a practical necessity from the point of view of the desirability of reducing the cost of production, and as we cannot sell our entire production in this country, foreign markets offer the only solution to our difficulties. The disposal of our surplus production in foreign markets in war-time is not perhaps a difficult problem, but it is bound to be so when hostilities cease and foreign competition again comes in It should, therefore, be our special endeavour to consolidate our position in all new overseas markets. At present, owing to the preoccupation of England, these countries are taking whatever we have to sell, but unless we begin to sell them what they actually want, both as regards quality and price of goods, we shall find ourselves deprived of these markets in due course. This, therefore, is the time for each and every millowner to secure direct contact with his overseas customers, to standardize qualities and refrain from departing from these standards for purposes of under-selling, for, taking a long view, there is nothing so detrimental to our interests in foreign markets as deterioration in quality Indian mills can and do produce goods as fine in quality as those turned out by England, Japan or any other country, and it will be by supplying quality goods of a consistently reliable standard that India can hold the markets which she gains during the war emergency.

While I say that the industry can face the future with confidence, I cannot overlook the fact that there are one or two matters on which we should concentrate our efforts. I would first refer to the necessity of research into the possibilities of improving our labour and technical efficiency. This research organization should also be responsible for investigating such matters as improvements in bleaching, dyeing, printing and finishing processes. A nucleus of such a research organization already exists in the Department of Chemical Technology

of the University of Bombay, but the activities of this institution could perhaps be widened if all millowners accorded greater practical and financial support to it. My second point is about technical education Practical instruction in spinning, weaving, bleaching and dyeing, etc., is at present given in the Victoria Jubilee Technical Institute and the textile classes conducted by the Social Service League, and the activities of both these institutions might be extended A large number of students who have graduated from the Victoria Jubilee Technical Institute are already working in our mills, and some of them have become managers and assistant managers. I would suggest the desirability of affording a further period of intensive practical training to the textile students who graduate from the V J.T Institute which would enable them to take up administrative and executive positions in mills without any further apprenticeship. If the suggestion is adopted, it would not perhaps be necessary to send our young men to England, America and Germany to prosecute their studies. These specially trained people would be our mill managers of the future, and though I concede that Lancashire mill managers have been largely responsible for building up the Indian mill industry, I cannot help feeling that the time for organized Indianization has arrived.

In conclusion, one does not know what will be the consequences of the war and the peace that will ensue afterwards, what will be the position of the currency of the various countries, what kind of tariff policy will be adopted by the different countries, and, lastly, what policy the Government of India will follow in relation to various countries. But if we now take energetic measures to conserve our resources and our trade in the Eastern markets by supplying quality standard goods and by perfecting our organization in those markets, I have every hope that we can look forward to the future of the industry with confidence to progress on a sound basis. I am also confident that, if we look far ahead and conserve our position now, we shall eventually be able to hold our trade in all new war-time markets.

What of the Future ?—(Concluded from p. 15)

foreign supplies, but would also remove the somewhat unthinking prejudice which exists against their use. On the selling side, greater enterprise and more modern methods are called for, and if our export trade is to be developed to the full extent of our capabilities, an organization needs to be set up for the purpose of energetically pushing our goods into the markets which lie at hand. The countries on the Indian littoral and bordering the waters of the East consume well over Rs. 50 crores worth of textiles and, while Japan is a formidable competitor in normal times, the possibilities of expansion of our exports are considerable. Indian mills during the last few years have branched out into many new lines, notably in the printing trade, and should be capable of attracting the custom of foreign countries. India possesses about 10 per cent. of the world's spindle and loom capacity, and with the exception of China, has a greater home market than any other country in the world. Possessing this and other advantages, the industry should have it in its power to bring prosperity to all who are engaged in it and be a great national asset.

THE INDIAN COTTON TEXTILE INDUSTRY

Ву

Sir SORABJI SAKLATVALA, Kt., M.L A.

To sextremely difficult to give a complete history of an important national industry like the Cotton Textile Industry which started over eighty years ago and spread itself not only throughout all the Indian Provinces but also several Indian States, within the compass of a newspaper article. The best way to deal with the subject is to let actual facts and figures speak for themselves, confining criticism strictly to a few important phases of the industry. In order to have a clearer perspective of the progress of the industry and its future prospects, I think it is necessary to give, in the beginning, an idea as to its present capacity and the place occupied by it in India's national economy.

Productive Capacity

Number of mills	389
Number of ring spindles	9,638,186
Number of mule spindles	421,184
Number of operatives em	ploy-
ed on the day shift	441,949
Quantity of cotton consume	d 3,810,734 bales.
Production—	
Yarn	1,300 million lbs.
Cloth	4,300 million yards.
Total paid-up capital	Rs 46 crores.
Total cost of block	Rs 100 crores.

Its Place in the World Cotton Textile Industry

From the point of view of spindleage and loomage . Fifth. From the point of view of cotton consumed . . . Second

Its Place in India's National Economy

- (a) Supports $4\frac{1}{2}$ lakks of workers and their dependants, excluding about 200,000 employed on night shift.
- (b) Consumes more than 50 per cent. of India's cotton crop.
- (c) Affords subsidiary employment to large numbers of persons who are engaged in various trades which directly depend upon the Cotton Textile Industry.

Distribution of the Industry

	Where situated	No of mills	No. of spindles mstalled	No of looms installed	Average No of hands employed
1. 2. 3	Bombay City and Island. Ahmedabad Rest of Bombay Presi-	68 77	2,850,774 1,901,872	67,235 46,853	
	dency (including Sind)	62	1,263,651	26,852	63,541
	Total	207	6,016,297	140,940	254,738
4. 5. 6 7. 8	Rajputana Berar Central Provinces Bihar and Orissa Hyderabad (Nizam's	6 4 8 2	88,524 68,312 323,502 27,500	1,437	4,070 18,683
9. 10. 11. 12. 13. 14.	Dominion) Central India Bengal Presidency Punjab Delhi Province United Provinces Madras Presidency (including Cochin	6 16 30 8 6 26	444,196 111,264 108,634	10,972 9,940 2,647 3,112	25,767 22,112 6,568 5,030
15. 16. 17.	State)	58 1 8 3	12,000	300 2,607	590 9,033
	Grand Total	389	10,059,370	202,464	441,949

History of the Industry

Though Bombay happens to be the home of the cotton textile industry, the first cotton mill was put up in Bengal about the year 1852. The first cotton mill to be put up in Bombay was the Bombay Spinning Mill (1854) which owes its inception to a Parsi merchant, Mr Cawas-jee Davar. Other mills followed later, and the following table brings out how by successive stages the industry's productive capacity was raised.—

	Year		No of mills	No of spindles	No of looms
1876 1880 1890 1900 1905 1910 1915 1920 1925 1930 1935 1939	 	 	47 56 137 193 197 263 272 253 337 348 365 389	1,100,112 1,461,590 3,274,196 4,945,783 5,163,486 6,195,671 6,848,744 6,763,076 8,510,633 9,124,768 9,685,175 10,059,370	9,139 13,502 23,412 40,124 50,139 82,725 108,009 119,012 154,292 179,250 198,867 202,464

It should not be inferred from the above figures that the rate of development was uniform in all centres of the industry in India. The following figures show how Bombay City fared as against all other centres:—

Year		Bomk	oay City	Rest	of India	Percentage of Bombay to the Total	
•	_]	No of looms	No of spindles	No. of looms	No of spindles	Looms	Spindles
1876 1880 1890 1900 1905 1910 1915 1920 1925 1930 1935 1939		8,041 10,856 13,785 22,215 28,973 41,931 51,846 60,634 72,266 76,697 68,385 67,235	1,895,660 2,536,891 2,560,916 2,824,046 2,994,367 2,964,526 3,456,233 3,430,733	2,643 9,627 17,909 21,166 40,794 56,163 58,378 82,026 102,553 130,482	473,914 1,378,536 2,384,867 2,602,570 3,371,625 3,854,377 3,798,550 5,054,400 5,694,035 6,695,087	80 4 58 8 55.3 57 8 50 7 48.0 51 0 46 9 42 7 34 4	74 2 67 6 57.9 51.3 49 6 45 2 43 7 43 9 40.6 37 8 30 9 28.3

While the "Rest of India" has done very well in the last decade or so as against Bombay, the following table brings out that a much faster pace of expansion has taken place in Indian States than in many centres in British India:—

Year		British	India	Indian States		
	_ -	Spindles	Looms	Spindles	Looms	
1917-18 1920-21 1923-24 1926-27 1929-30 1932-33 1935-36 1938-39		6,170,000 6,244,000 7,194,000 7,622,000 8,127,072 8,121,262 8,096,826 8,686,211	106,396 109,422 133,060 142,734 155,805 160,110 164,198 172,161	443,279 408,526 708,648 791,228 894,807 1,044,586 1,212,530 1,373,159	8,409 8,531 14,027 15,390 17,542 20,594 26,277 30,303	

The steady expansion in Indian States is due to certain advantages enjoyed by cotton mills in Indian States.

In Bombay City

The following table indicates the stages by which the City mill industry was built up -

1855 1 mill 1856-70 .. 12 mills 1871-75 .. 15 ,, 1875-85 .. 23 .. 1885-95 .. 1895-1905 16 1905-15 .. 8 1915-25 .. l mill 97 mills

Out of these 97 mills, 15 mills were scrapped in the period 1926-39, and 13 mills scrapped or burnt down in the period 1895-1915, with the result that in Bombay we have only 69 mills to-day. The pace at which fresh mills were put up or the old ones demolished affords a true indication of the trading conditions of those days

After the establishment of the first few mills in the period 1854 to 1860, there was a temporary lull in mill building activities on account of the American Civil War, which led to an abnormal expansion in the demand for Indian cotton at really fabulous prices. The enormous wealth which accrued to Bombay as a result of this war and which was computed at about 75 million sterling led to the formulation of wild and fantastic get-rich-quick schemes all of which collapsed abruptly like houses of cards. The price of Indian cotton fell with appalling rapidity, bringing in its train several financial disasters. Normality, was, however, restored by 1868, and as many as 17 mills were put up in a period of five years. It was in this period that Mr. J. N. Tata bought a derelict oil mill in Chinchpoogly, and converted it into a spinning mill called "Alexandra Mıll.'' This mill was sold in 1872 'at an enormous profit." For a period of about fifteen years, i.e., 1875-90, the industry was moderately prosperous. Then there was a setback in trade, but the situation was met by mills working organized short time. This was followed by serious strikes in 1892. In 1893, the Mints were closed for the free comage of silver. Never before in the history of modern trade has legislation had a more disastrous and immediate effect on an important and well established industry. With the precision of an automatic machine, business with China and Japan came to a standstill as the exchange dropped by about 12 per cent. to 15 per cent. to the detriment of India. To make matters worse, there was a violent outbreak of plague followed by a serious famine, all of which contributed in no small measure to the difficulties experienced by mills in these years, and it was not before 1903 that conditions became normal. The loss of the trade with China and Japan with which Bombay mills were doing a profitable trade in yarn was a serious matter, and though the situation, so far as China was concerned, improved to a certain extent in the period 1903-15, the Japanese market was lost for ever in 1894 and the Chinese market was practically lost in the immediate post-war years in the face of severe competition from Japan. India is now importing yarn from these countries.

The diminution in the export market in the early nineties vividly brought to light the necessity of devising

means for improving the offtake of Indian yarn in India itself, and the Bombay mill industry which was so far a pre-eminently spinning industry began to adjust itself to the changed circumstances, which ultimately led to the development of the weaving industry. The following figures show the advances made in this direction in Bombay:—

Year				 Bom	No. of looms	
		ear		Looms	Spindles	in Bombay per 1,000 spindles
1890 1895 1900 1905 1910 1915 1920 1925 1930 1935 1939				 13,785 20,217 22,215 28,973 41,931 51,846 60,634 72,266 76,697 68,385 67,235	1,895,660 2,123,892 2,536,891 2,560,916 2,824,046 2,994,397 2,964,526 3,456,233 3,430,733 2,990,088 2,850,774	7.8 95 88 113 14.9 17.3 205 209 224 229 236

The European war of 1914-18 afforded an enormous fillip to the Bombay and Indian mill industry. Before the war, the United Kingdom alone was exporting about 3,000 million yards of cloth to India, and Indian mills were supplying only about 1,100 million yards of cloth. The war seriously dislocated the United Kingdom cotton industry, but provided a very good opportunity for Indian mills to expand their production. Though the war ended in 1918, the boom which resulted from it lasted till 1922, and cotton mills in Bombay, in common with mills in other centres of the industry and other industries, made large profits. It was mostly due to such profits that many mills in Bombay were at all able to carry on during the slump that followed the boom. Depression set in in 1923, and from then onwards till 1937 the Bombay industry was not in a position to make ends meet, but in 1938, for the first time after fifteen years of continuous losses, the Bombay industry was in a position to show a modest profit of about Rs. 24 lakhs on a block costing about Rs. 331 crores after providing for full depreciation.

It is not correct to say that the trade depression commenced in 1923 in all centres of the industry. The wave of depression started in Bombay and very gradually spread to other centres in varying forms of intensity. The situation in Bombay was rendered more difficult by successive labour troubles. It is very unfortunate that in Bombay there is no proper labour organization, the most prominent union—the Red Flag Union—being entirely dominated by Communists. The years 1928 and 1929 proved most disastrous to the Bombay industry purely on account of the Communist movement which got hold of the textile workers of Bombay. Another disastrous strike followed in 1934 and the wanton strike which ended on 13th April 1940 caused a stoppage of over a month resulting in heavy losses not only to the workers and the employers but also other sections of the public.

Organization of the Industry

The industry owes its inception to the foresight and business integrity of our forefathers who floated their mills with their own money supplemented with that of their friends. In those pioneering days, it was so very difficult to attract outside capital that in several cases the block and even the day-to-day running expenses had to be financed from paid-up capital with the result that an extremely cautious policy had to be (Continued on p. 307)

RANDOM RAMBLINGS

Βv

"POVERTY KNOCKER"

f A FEW Englishmen will recognize the meaning of the nom-de-plume adopted by the writer of this article, namely, "Poverty Knocker", but to Lancastrians of an older generation the term would at once signify the handloom weaver. Its derivation is uncertain, but sitting as I did in my boyhood days at the feet of weavers busily engaged on their handlooms, I did think that the generic term "Poverty Knockers" was due to the sound made by the knocking of the shuttle in its travels to and from the shuttle boxes. The noise seemed to be a monotonous repetition of the word Poverty—Poverty, and it was to this music that my first affection for the textile arts was born. True, it was a poverty-stricken existence, and in spite of social reformers of the Manchester Political School and enthusiasts of the William Morris type, it was a losing battle for the handloom weaver in Lancashire, as it almost appears to be for the handloom weaver in this country. Nevertheless, I still know of handlooms merrily plying their trade within six miles from Manchester Town Hall, although I must admit that these looms are on specialities with which the power-loom has been unable to compete on an economic basis.

To me the outlook for the thousands of handloom weavers in this country depends on their ability and on the guidance of Government, to adapt themselves to cloths with which the power-looms—whether automatic or non-automatic—cannot compete. The well-known Madras handkerchief indicates possibilities in this direction, and coupled with assistance from mills in the shape of cheap yarn through co-operative sources, it should be possible for co-operative societies to develop specialized styles such as pick and pick varieties, pocketing cloths, multicolour styles, to give back to the handloom weaver in India a pride in his artisanship and at least something above subsistence level.

Is it an idle dream to hope that the co-operative movement given to the world by a group of Rochdale handloom weavers should turn the cycle round and give to the Indian handloom weaver an improvement in his penurious existence? The handloom weaver of my day became extinct within a few years, except for specialities, and my early memories go back to being chased out of the winding department of a mill making dhooties for shipment to a far-off country called India. Surely in those boyhood days the vision of those vivid colours for dhooties must have made an impression which ultimately landed me in my early twenties as a weaving master in India.

Advent of Artificial Fibres

I am afraid the first portion of this short article has moved on lines that I determined it should not do. In a Jubilee issue there is bound to be a tendency to give reminiscences and I made up my mind to avoid this, but if reminiscences do crop up, I crave the reader's forgiveness. My real intention was to briefly survey the textile industry of over thirty years ago with its existence to-day and to ramble into speculation as to the future of the industry. The advent of artificial fibres of

the rayon variety certainly caused a revolution in textiles and many people thought that with the advent of staple fibres the cotton crops of this world were doomed to extinction except when grown as a means of producing cellulose. Time has proved that with the growing wealth of the world, artificial fibres have added to the clothing of mankind and provided additional decoration, apart from any question of their use as ordinary clothing materials. But to-day we are looming ahead on other non-cellulosic materials, of which the best known to-day are nylon and vinyl. The development of polymerization in the last twelve years has given us materials built up synthetically from the elements most common in this world—coal, air and water, to create a completely new molecular structure of its own. It is an entirely new arrangement of matter of the first completely synthetic fibre ever made. This fibre is cold drawn and possesses features such as indicate that the silkworm is threatened with technological unemployment. Although it differs in some of its properties from silk, it is a much greater challenge to silk and, incidentally, to other fibres than ever rayon looked like being. Mass production is bound to bring down prices and a new field looms ahead for the young textile technician to-day which is far in excess of any field ever held out as a prospect to generations gone by.

My own career has been phenomenally interesting in the development that has taken place since my youth and I almost put forward a sigh of regret when I feel that the allotted span of life will not allow me to see the full development that these synthetic fibres have opened out before us. Textiles of the future, I fear, will be plastics and polymerized products to such an extent that one visualizes cloth being made in woven or knitted form merely by the extrusion of a synthetic material through spinnerettes meandering to pattern at a terrific speed in and out of one another after the type of a Maypole. Half cross or full cross lenos will have no terrors for spinnerettes that can circle around each other and it is certain that the development in this direction will result in the production of more novel and more utilitarian fabrics. But, away with such speculation. Let us come down to the present and briefly run through what the best present-day practice in the cotton textile industry is supposed to be, particularly for this country

In the mixing and blow room we have to-day as one of its principal aims the removal of dust, and if anything has impressed the writer in this country, it is the development of more humanitarian principles and the better treatment of labour, resulting from better education and through international influences for which the International Labour Office at Geneva should be given a great deal of credit. A good arrangement for a blow room would be for hopper bale openers delivering on to a fast running belt to hopper opener with long box, Porcupine opener with Shirley cage and transit timing arrangement, Crighton opener, Dust trunks, Exhaust opener with automatic distributor, Finisher scutchers with hopper feeders, condensers

and fans motor driven, cone drum regulator roving waste opener with hopper feeder and electrical control. In conjunction with these would be dust filters receiving exhausts so that dirt removed during the opening process would be kept under control.

There has been little development in card and drawing frames other than minute alteration in details, but it is interesting to note the success that has attended mills in this country who have increased the number of cards per preparation and made up their mind that carding had to be the preparation of a clean sliver and not the preparation of a maximum weight of cotton into sliver form regardless of quality. More cards per preparation, more profit

In the drawing frame the chief fight has been between the metallic roller and the leather roller as known in India. In America the metallic roller has definitely won and a good article could be written on the pros and cons of this subject. A development of a combination of Derby doublers and sliver lap machine with the drawing frame has been made during recent years to ensure better regularity on the final yarn. For the time being this rearrangement is still under consideration and test before final technical acceptance, but my own opinion tends to the belief that the old practice of three heads of drawing running at a reasonably low speed will not be beaten by the new system.

Improvements in slubbers, inters and ring frames have practically all centered on a minor improvement, other than various schemes of high drafting. The new Casablanca type holds the field in so far as my own personal experience is concerned, but I am prepared to admit that there are many other good types of high drafting, including the combined slubber inter.

Improvements in the construction of speed frames whereby appreciably higher speeds have been possible, is another point on which I could write with nothing else but approval from personal experience, but perhaps some day, for the sake of argument, I will put down in an article for this paper, what I consider the ideal mill to-day for this country.

High speed winding and warping have made a great deal of progress in this country and if I was installing new plant I would have no hesitation in adopting one of the many excellent high speed winding and warping systems for the preparation of warpers beams. Equally, air drying slashers of the latest type with a circulating size system and size boilers attached to each frame would represent slasher sizing as near perfection as could possibly be expected in this imperfect world.

Wire healds are driving out knitted yarn healds in most mills in this country. I do not wish to discuss this point fully here, but the probability is that this development has been due to the extraordinarily cheap prices at which wire healds have been delivered in this country from Japanese sources.

Automatic Loom

With the rise in wages in this country the automatic loom has better opportunities for adoption here than it ever has had in its past history. Many shrewd goahead millowners have installed automatic looms and we shall all watch these developments with keen interest. If I was compelled to venture an opinion, I would think that with existing Lancashire type looms already installed,

It would pay to manufacture on these looms on the 6-loom 7-hour principle, since in both cases good quality yarn is required and the product is usually cloth of the mass production style. Similarly, high wages have left the field open for the installation of automatic pirn winders and here again, if I was installing a new mill, I should have no hesitation in putting in automatic pirn winders in spite of the lower wage cost in this country.

The merits of the flat dagger pirn are still under discussion and I am afraid the difficulty in obtaining supplies due to the war will compel this matter to be left over for a post-war decision. In any case, combined with the automatic pirn winder, the dagger pirn specially adapted to the special requirements of this country should be worth serious experiment.

On the bleaching, finishing and, as one might call it, the general chemical side of the industry, India has gone ahead almost beyond belief and it is in this section of the industry that I look for the biggest advance in the near future. The development of crease-resisting processes, imitation linen finishes, mercerising, both yarn and cloth, calico printing and the engraving for the same, waterproof finishes, Latex finishes and controlled cloth shrinkage are almost a romance and countless other processes of a chemical nature are being installed every week. The development of calico printing alone has been gigantic and with a combination of the artisan craftmanship and modern processes, there is no reason why calico printing in its best form should not return in bulk to the land of its origin.

Scores of other developments are possible, but are not within the scope of this article in detail. We have in India latex in the form of natural rubber provided in enormous quantities and yet I do not know of any serious development for the utilization of latex in the many forms allied to textile industries of this country, whether cotton, jute or hemp.

Scientific Research

Given the wealth that would be necessary for the industrial development of textiles in this country, I would certainly utilize some in endowing scientific research for the better use of indigenous dyeing material, particularly by its application in conjunction with the many pre-treatments and after-treatments dyestuffs and fabrics receive to-day after dyeing with dyes not existing sixty years ago, at which time indigenous dyes went out of existence.

Another form of research would be into the resins available in this country and the possibilities in the polymerization of these resins. Latex would come under this head and I feel sure that money spent on research into the application of Latex to textiles, would reap a really rich reward. I am afraid I have rambled on and not touched the many other developments possible in the textile industry such as knitting and the ease with which the knitting machinery of to-day imitates the woven fabric. Within the small compass of an article of this nature it is impossible to go into keen technical detail, but enough suggestions have been put forward to warrant serious thought being given to it by all interested in the development of the textile industry of this country. If this article only results in a few technical experts thinking on novel and original lines as to how the textile industry of this country can be improved it has been worth my trouble in writing it.

EVOLUTION OF THE COTTON TRADE OF BOMBAY

Ву

Sir PURSHOTAMDAS THAKURDAS, Kt., C.I.E., M.B.E.

TN 1787, the East India Company sent to India Dr. Hove to study the Indian cotton trade and Indian cotton plants. He reached Bombay in July of that year, and extracts from his account of his journeys in the cotton tracts of Bombay show that while touring in the Broach district Dr. Hove was struck by the commonness of irrigation of cotton from tanks, wells, and rivers. Even then, there was a large export of cotton, both raw and manufactured, to other parts of India and to Britain, France, Holland and the Far East. The price of the finest cotton then was Rs. 60 per candy or annas $1\frac{1}{4}$ per lb. It is not possible to form an estimate of the total produce of cotton in India in the early part of the nineteenth century, but in 1802 it was stated that the average import of cotton in Bengal was about 43 million lbs. All this used to be worked out on handlooms.

In 1804, only a small portion of the cotton exported from India was produced in the East India Company's possessions, and the remainder came from territories not subject to the Company.

History of the Bombay Market

- 2. In the early days of trading the Bombay cotton market or "Green" was situated in front of the present Town Hall and from that site, owing to the steadily increasing volume of trade and consequent congestion of traffic and also in order to reduce transport charges, it was moved to Colaba in 1844, as Colaba in those days, with its facilities for landing cotton brought by country craft and for loading vessels in the harbour, and with the then ample open space around it, was considered to be the most convenient situation for the trade. There the trade was domiciled for over three-quarters of a century, when it became increasingly obvious that a change of locality was necessary in the interest of the cotton trade and the city in general, owing to the increased traffic on the city roads and the distance that separated Colaba from the railway yards where cotton began to arrive in greater quantity and the mills and docks where it had to be taken for consumption and shipment. In 1923, when the warehousing accommodation provided by the Bombay Port Trust at Sewri was available, the trade, in deference to the wishes of Government, left its old home and came to a temporary structure at Sewri with all the advantages of a newly developed centre. By this move transporting charges were further reduced, as Sewri was nearer the mills and docks than Colaba.
- 3. By a long-standing practice of many years forward trading was daily carried on in two separate sessions at two different places. The afternoon session took place at Colaba subject to the rules of the Bombay Cotton Trade Association until it was replaced by the Cotton Contracts Committee and later by the Cotton Contracts Board and, since June 1922, under the regime of the East India Cotton Association after the trade was decontrolled by the Cotton Contracts Board. Circum-

stances that led to the formation of the Cotton Contracts Committee, the Cotton Contracts Board and the East India Cotton Association are related later. On the removal of the trade to Sewri on 1st November 1923, the afternoon sessions continued at Sewri till the 11th February 1929 when it had to be temporarily suspended owing to the riots which took place in the city in that year and made it rather risky for people to go to comparatively thinly populated areas for some time. After a few weeks when the risk and emergency had disappeared, those interested in spot trade found it really convenient to them not to have afternoon sessions of forward trading at Sewri from 4-30 onwards upto sunset as customary, but to have dealings in spot cotton, restricted to the hours of 11 a.m. to 2 p.m. as had been necessary during the period of, and, for a few weeks after, the riots. A tug-of-war started between those dealing only in ready cotton and those interested in both ready and forward cotton. The contest lasted for a period of six years almost till those who consigned cotton from upcountry for sale to Bombay definitely made it clear that their correct interest was served by not reviving the old practice of afternoon sessions at Sewri Cotton Green. The staff and labour working on the Cotton Green looked upon any return to the old practice as definitely harmful to them and the trade has now settled down at the Cotton Green to the activities on the Green being over before sunset and in the summer months at 6 p.m., which gives the employees about an hour in hand before sunset after finishing their duties.

The midday sessions had always taken place at Marwari Bazar and upto 1934 was held in a comparatively ill-conditioned and darkish room at Sheikh Memon Street under the regime of the Bombay Cotton Brokers' Association when the control of the futures trading ring in the Bazar was taken over by the East India Cotton Association as a result of the recommendation of the Wiles Committee. The ring is now accommodated in the magnificent six-storied building erected by the Association on the old site at the corner of Sheikh Memon Street and Kalbadevi Road.

4. The distribution of the raw cotton of India from Bombay dates back to more than a hundred years, and such distribution was carried on in a haphazard manner without any set organization which can be quoted to-day as the foundation of organized cotton trading in Bombay, either for ready or for forward delivery. The first documentary evidence about this that I know of is an agreement made about Samvat Year 1912, that is, about 85 years back, by the then leading merchants dealing in spot cotton, imposing voluntarily a cess on cotton for the purpose of avoiding mendicants and others assembling at a weighment scale in order to ask for a handful of cotton, which apparently had been willingly given till then by those who delivered cotton. This cess amounted to $1\frac{1}{4}$ annas per candy and was very loyally paid for more than half a century, and to-day, the Bombay Cotton Dealers' Association own Government securities of the face value of Rs. 5 lakhs, which amount is being administered for charitable purposes in accordance with a resolution of the Bombay Cotton Dealers' Association passed at a general meeting of the cotton merchants on 26th October 1887, pursuant to which a Declaration of Trust was prepared in 1893. There are many interesting details about the administration of this fund, but during the last few years, the Trustees have begun to give help out of this fund to such of the labourers and others working in the Cotton Green as find themselves stranded in their old age and do not command the means to carry on in the evening of their lives.

The Bombay Cotton Trade Association, Limited, and the Bombay Cotton Exchange, Limited

- 5. The first organized association was started in 1875 by European firms in Bombay engaged in the cotton trade and was styled the "Bombay Cotton Trade Association, Ltd." This was a joint stock limited company, with shares of the face value of Rs. 1,000. Practically all the shares were held by non-Indians who controlled that Association.
- 6. About 1890, owing to grave dissatisfaction amongst leading Indian cotton millowners and merchants, the Bombay Cotton Exchange, Ltd., was started among others by Sir Dinshah Petit, the First Baronet, Cursondas Vallabhdas of the firm of Jivraj Baloo, and Narandas Purshotamdas of the firm of Narandas Rajaram & Co., the stalwarts of the cotton trade and industry of that period, and was registered in 1893. This company started with a capital of Rs. 25,000 in 500 shares of Rs. 50 each with power to increase, and the value of these shares rose to Rs. 200 per share. These two rival organizations divided control of the cotton trade, forward and ready, between themselves from 1893 to about 1918. In the meantime, about the year 1907, the Bombay Cotton Trade Association issued three new shares, giving them to two Indians and a Japanese at a valuation of about Rs. 12,000 per share. The first Indian Surveyor and member of the Appeal Committee appeared at survey tables and in the Appeal Room of the Bombay Cotton Trade Association in 1907.

Regulation of the Cotton Trade by the Cotton Contracts Committee and the Cotton Contracts Board

- 7. In 1916, the Bombay Cotton Trade Association offered to take more Indian shareholders, but in 1918, a committee constituted by the Government of India and called the Cotton Contracts Committee took over the regulation of the cotton trade in Bombay under the Defence of India Rules.
- 8. This body was replaced in 1919 by the Cotton Contracts Board constituted under the Bombay Cotton Contracts Act, 1919, and worked under the chairmanship of a Government officer. This legislation which vested in that body the control of dealings in cotton in the Presidency of Bombay was also of a temporary nature and its life was confined to the duration of the Great War and for such period thereafter, not being less than six months and not exceeding two years as the Governor in Council might by notification direct.

Formation of the East India Cotton Association, Limited

9. As a result of the Indian Cotton Committee's (McKenna) Report, the Government of India addressed the Government of Bombay in 1920 inviting the Cotton Contracts Board to proceed with the formation of the

East India Cotton Association on a broader basis and laid down certain conditions on fulfilment of which they agreed to grant a Charter to such an association with requisite powers to control. A scheme was prepared by a Committee of the Cotton Contracts Board on the lines suggested by Government but as there was strong opposition, especially from the brokers, to such a scheme being adopted, it did not fructify. There was also a certain amount of opposition to the control of the cotton trade by the Cotton Contracts Board and trading was closed from September to November 1920 as a protest After much discussion and consultation it was agreed to release the Board's control over the trade in respect of contracts for the crop of 1921-22. However, efforts to organize control of the cotton trade by cotton merchants on a voluntary basis were started at the end of 1920, and eventually the trade decided to form a small committee representing all sections of the trade, including a representative of the Cotton Contracts Board, to draw up a scheme for the formation of the East India Cotton Association, which was incorporated under the Indian Companies Act of 1913 on 19th October 1921, but the constitution of the Board of the Association did not meet with the approval of the Millowners' Association and their members kept out of the Association at that stage.

10. The Cotton Contracts Board ceased to function with effect from 12th November 1921, according to the arrangement referred to above, but as no machinery was provided for dealing with contracts that were entered into for the season 1921-22, it became necessary to reinstate the Cotton Contracts Board temporarily, i.e., until contracts upto May 1922 had matured. This interval was utilized to bridge the differences of opinion existing between the East India Cotton Association and the Millowners' Association through the mediation of Mr. G. (now Sir Gilbert) Wiles, the then Chairman of the Cotton Contracts Board. After considerable discussion a rapprochement was arrived at, and when the Cotton Contracts Board ceased to function with effect from 1st June 1922, the constitution of the East India Cotton Association was revised whereby all sections of the trade, including the Millowners, became members of this body. Under the revised constitution the trade was classified into six panels, as follows:—

- 1. Millowners.
- 2. Exporters.
- 3. Importers.
- 4. Commission Agents and Merchants.
- 5. Jaithawalas.
- 6. Brokers.

Each of these panels had a Representative Committee consisting of 15 members elected by the respective members of the panel and these 90 elected the Board which consisted of the following:—

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(1) 3 (2 elected and 1 co-opted) ... Millowners.
(2) 3 (2 elected and 1 co-opted) ... Exporters
(3) 3 (2 elected and 1 co-opted) ... Importers
(4) 2 (elected) ... ... Commission Agents and Merchants.
(5) 2 (elected) ... ... Jaithawalas
(6) 3 (2 elected and 1 co-opted) ... Brokers.
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11. The Representative Committee of these panels, in electing two directors as mentioned above, were required to elect one Indian and one European to represent their respective panels with the exception of the jaithawalas' panel, for which it was not compulsory to elect a European, and both of that panel's represen
(Continued on p. 291)

TRADE TREATIES AND PACTS

Βv

SHETH KASTURBHAI LALBHAI

In a way it is strange that the Indian Textile Industry should be the subject-matter of trade pacts and trade agreements. It is well known that trade agreements are generally negotiated for the purpose of safeguarding or expanding export markets. This motive does not, of course, influence all the countries equally; nor is it always the sole determining motive; nevertheless, it does play a dominant role in all trade agreements. It is, therefore, a little unusual to see that the Indian Textile Industry which has no export markets which it could call its own, should not only be a matter of trade agreements, but also occupy the central position in all such discussions

To understand this unusual position, it is necessary to have an acquaintance with negotiations for trade pacts. With all their solemnity these negotiations are essentially business bargains and are conducted with equal astuteness and adroitness Consequently, the negotiating parties not only try to get the maximum of quid pro quo for the concessions they are granting, but also try to make the best use of their stronger bargaining position. Unfortunately, we export several raw materials which are equally well produced elsewhere in the British Empire. We are also politically dependent on the United Kingdom It is, therefore, always possible for the UK. to use her political position to an economic advantage, and yet create an atmosphere of altruism. This secures for her a stronger bargaining position in all matters. On the other hand, in the case of a country like Japan, our comparative dependence for the exports of raw materials, encourages a belief that we could be made to purchase our privileges at a heavy cost. If simultaneously with this position, it is realized that both these countries are also interested in the export of cotton textiles, it will be easy to see why the Indian textile industry comes into the picture. These countries would not agree to any scheme of preferences in respect of our exports unless their claims for their cotton industries are satisfied. This is not to say that their claims are justified; nor also to say that the advantages we have secured have been commensurate with the sacrifices imposed on our textile industry. It is only to give a glimpse of the forces which dragged the Indian Textile Industry into being a subject-matter of trade discussions.

The movement in this direction started first with the discussions which ultimately crystallized into the Ottawa Agreements. It will be remembered that by the Ottawa Agreements, the U.K. agreed to grant certain preferences to Indian exports to the U.K., and India in return granted similar preferences to the U.K. products imported into India. In this, the main idea was to revive the export trade of the U.K., and also to secure for it an additional margin for competing with the products of other countries like Germany, Italy, Japan, etc. The textile and steel industries were, however, specifically kept out of this arrangement. This was partly due to the fact that a Tariff Board was already reviewing the position in respect of textiles. It was also due to a feeling and atmosphere in the country, recognized by the Delegation, that protected industries could not be permitted to be subjects of trade bargain. It was, therefore, felt safer not to precipitate matters by increasing the unpopularity of the Ottawa Agreements Soon, however, the Tariff Board came to findings which were not favourable to the Lancashire industry. Consequently, so far as the Ottawa Agreements were concerned, they failed to secure anything for the Lancashire industry. On the contrary, they established a definite principle that protected industries could not be the subject-matter of trade bargains.

Before, therefore, anything further could be done, and the textile industry could once again be brought into the picture, it became necessary to nibble away at this division raised between the protected and the nonprotected industries. The attempt in this direction took two forms. A feeling was created that, whatever the recommendations of a Tariff Board in respect of a protected industry may be, they could be suspended if the industry itself thought otherwise. The result was the Mody-Lees Pact, by which certain concessions were promised to the Lancashire textile industry. During the discussions prior to the agreement, it was realized that not all the Indian textile interests agreed to this arrangement; in fact, there was a sharp division of opinion on the matter In spite of that, however, the Government of India adopted the Agreement, instead of the recommendations of the Tariff Board.

The second step in this direction was the signing of the Supplementary Agreement in 1935. By it, the Lancashire industry got three important concessions:—

- (1) That the measure of protection to be afforded shall be only so much as, and no more than, will equate prices of imported goods to fair selling prices for similar goods produced in India, and that wherever possible, having regard to the provisions of this article, lower rates of duty will be imposed on goods of United Kingdom origin.
- (2) That when the question of the grant of substantive protection to an Indian industry is referred for inquiry to a Tariff Board, the Government of India will afford full opportunity to any industry concerned in the United Kingdom to state its case and to answer the case presented by the other interested parties.
- (3) That in the event of any radical change in the conditions affecting protected industries during the currency of the period of protection, they will, on the request of His Majesty's Government or of their own motion, cause an inquiry to be made as to the appropriateness of the existing duties. The Textile Tariff Board of 1935, which was appointed immediately after the conclusion of this arrangement, naturally made the inquiry into the effectiveness of the existing protective duties in the light of these principles, and in 1936 there was a reduction of duties on the imports from the U.K., on plain greys from 25 to 20 per cent, bleached and coloured goods from 25 to 20 per cent. The other duties were left as they were.

Naturally there was considerable opposition in the country to both these moves, as the implications of these arrangements were far-reaching. Whatever view one

may take of the circumstances which led to the Mody-Lees Pact, it is difficult to justify the course masmuch as such a step was contrary to all the underlying ideas of Protection. The principle that private agreements could take the place of the recommendations of a Tariff Board cut across the prestige and the importance of a Tariff Board and rendered its recommendations valueless unless they were favourable to the Government. Besides, protection is granted to an industry as a measure of furthering general economic well-being and since the country, as a whole, bears its cost, it cannot be permitted to be a matter of private bargaining. The Supplementary Agreement itself dangerously encroached on the principle of fiscal autonomy. The essence of fiscal autonomy is that we should be able to revise our tariffs as and when it pleases us. Instead, under the Supplementary Agreement, the Government of India bound itself in advance as to the extent to which the duties will be revised. Not only that, we gave the choice of initiating the revision to His Majesty's Government in the U.K. It is a surprise that the Government of India could take this step, as it could be easily seen that the terms of the Supplementary Agreement were such as no selfrespecting Government could accept

Anyway, Lancashire succeeded in bringing the Indian Textile Industry into the picture. To appreciate the exact effect of this change, we must recapitulate the course of events in respect of Raw Cotton. In 1933, to meet the depreciation of the yen and the consequent increased imports of Japanese piecegoods, import duties were raised from 50 per cent ad valorem to 75 per cent ad valorem and the minimum specific duty from $5\frac{1}{4}$ annas per lb. to $6\frac{1}{2}$ annas per lb. on piecegoods imported from countries other than the U.K. This led to a negotiation for an agreement with Japan which was ultimately concluded in 1934 with the following terms:— The basic quota of piecegoods to be exported from Japan to India in any year was fixed at 325 million yards of cloth and was linked with an export of one million bales of raw cotton from India to Japan, with a proviso that for every additional 10,000 bales of cotton purchased by Japan, she would be entitled to send 1 5 million additional yards of cloth to India

During the currency of this agreement, the exports of cotton to Japan increased from 197,414 tons in the year 1933-34, to 433,223 tons in the year 1936-37. Similarly, under the Mody-Lees Pact, the Lancashire Delegation had promised that they would make serious efforts to popularize the use of Indian cotton and to increase its consumption in the U $\ensuremath{\mathrm{K}}.$ The exports of raw cotton to U.K also, therefore, increased from 61,087 tons in 1933-34 to 114,447 tons in 1936-37 Consequently, by the beginning of the year 1937, both these countries were getting a feeling that they had the upper hand in bargaining with us. Besides this, Japan was quite conscious now that so far as she was concerned, the import duties would not be reduced; nor would the difference between the duties on her goods and Lancashire goods be decreased to her advantage. On the other hand, the Lancashire industry was also confident that she could use the handle of her increased offtake of Indian cotton to our disadvantage without any danger of reprisals

In this, of course, both the countries were overestimating their advantages. While Japan could decrease her imports of Indian Cotton, she could do so only to a point as her machinery and the whole trade was adjusted to the use of such cotton. Besides this, her position in other export markets was gradually deteriorating as, like India, most of the Colonial and Dominion markets as well, had adopted fixed quotas for her goods However, what was at stake was not only her trade in piecegoods, but her entire trade with India, inasmuch as she had also developed a considerable volume of other trade All the same, she felt that the leverage of cotton could perhaps be used, if carefully tackled, to retain a substantial part of her quota So after prolonged discussions a new protocol was signed on lines substantially similar and for quantities equal to the old one with an allowance for the quantities on account of the separation of Burma. The distribution of the quota between various types of cloth was fixed as follows:—

Plain grey 40 per cent.
Bordered grey . . . 13 ,, .,
Bleached 10 ,, .,
Printed 20

This agreement was to last upto March 1940 and negotiations for its change are going on at present.

It is obvious that if the Indian textile industry were left to its own wishes, it would have liked to put a complete stop to the imports coming from Japan. This is due to the fact that the competition from Japan is far more serious and wider than the competition from the U.K. Besides this, it affects those lower and coarser ranges of cloth where the production of Indian mills themselves is also very large. But this aim could not be realized on account of circumstances already described, and the best that the Indian Textile Industry could do was to resist the pressure to increase the quota and to rearrange the categories so that competition would be concentrated only in those ranges where it could be less felt.

The consideration for the renewal of the Ottawa Agreement was laid on a much larger canvas As already stated, while Lancashire interests had of their own accord brought the Textile Industry into the picture, we were not prepared to accept the position. The Ottawa Agreements themselves were very unpopular with the country, masmuch as the concessions granted to the UK. and also the other disadvantages flowing from such an arrangement were far larger than the advantages that we got in return for them. So, during the protracted negotiations with His Majesty's Government in the U.K., the non-official advisers to the Government of India recommended that (1) so far as a consideration of the arrangement in respect of the duties on the piecegoods from the U.K. was concerned, they could not encroach upon the sphere of a Tariff Board by constituting themselves into one. (2) That the number of articles on which preferences were granted to the imports from the UK. should be severely restricted. (3) that the number of Indian exports to which preferences were granted in the U.K. should be increased.

But for the peculiar position, economic and otherwise, already described, this picture should have been complete here; the U.K. would have got a sufficient quad pro quo for the concessions we had asked for while the position of our exports was sufficiently improving to justify the concessions envisaged for the U.K. His Majesty's Government in the U.K. was, however, keen on securing something for the Lancashire industry and it soon became apparent that unless these claims were satisfied, it would be difficult to reach any agreement on other points. So, once again on account of the force of circumstances, the Indian textile industry was brought into the sphere of discussions.

It is not necessary here to go into the details of the subsequent developments which took place regarding (Continued on p. 306)

PROBLEMS OF THE INDIAN MILL INDUSTRY

By S. H. BATLIVALA

Broadly speaking, the future of this industry, which clothes not less than a fifth of the world's population and is self-contained as regards supply of cotton, labour and motive power, has behind it a sound economic background. Hence its remarkable progress in the last 70 years. During the first half of this period, i.e., upto about the year 1900, nearly 50 lakhs of spindles and 40,000 looms were installed in this country. In the next 35 to 40 years the spindleage figure has been doubled, while that of looms has been more than quadrupled. However, in order to ensure further progress and safeguard future prospects, we must go into various factors which have caused a number of upheavals in the industry.

Why Has Bombay Suffered?

These are particularly noticeable in Bombay which has all along been the most prominent mill centre. Scanning closely we find that the number of mills has now gone down from 90 to 70, the number of spindles has remained stationary at about 30 lakhs, but looms have increased by nearly 25,000 to approximately 70,000. These figures tell the tale of survival and prosperity of the stronger concerns, liquidation of weak companies and dismantling of old and worn out mills.

To what is this state of affairs due? Bombay mills lost their principal business of supplying yarns to China markets more than 30 years ago and have naturally turned to the production of cloth for Indian markets. Owing to the increase of mills up-country in centres favourable for the purchase of cotton and sales of goods, competition has taken a heavy toll, despite the golden years of the last war. Frenzied buying of old concerns at fabulous prices, frittering away of resources through extensions made with dearly priced post-war machinery and excessive payments of dividends had brought the industry in that city almost to the brink of ruin during the slump of recent years. At Ahmedabad also, which enjoyed a longer spell of textile prosperity, an intense depression set in and the weaker concerns had to go to the wall Many of these have come to grief through the greedy policy of charging managing agents' commissions either on the quantity or the value of goods produced. Under-capitalization also had made the existence of many a mill company precarious through dependence on public and bank loans. Similarly, overcapitalization had sterilized the capacity of the mills to ensure a fair return to the investors.

The principal lesson to be learnt from the tribulations of the millowners of Bombay and Ahmedabad is to cultivate a long memory for the tragedies of the past. This is very necessary as the events of the last war are capable of repetition. The method of charging commissions should be above reproach and criticism if the present structure of the industry, under which emoluments and allowances have become the patrimony of successive members of the managing agency firms, is to survive. These emoluments have no doubt their justification in financial and other valuable services rendered by the agents, and but for these many an

investor and many an employee would have fared worse.

Regional Specialisation

Decentralization of the industry is now taking place, as huge concentrations in single industrial areas have become a very uneconomic proposition. In the beginning of this century when the island of Bombay had 82 mills, the rest of India, excluding Ahmedabad, possessed about 80. The position at present is that the number of Bombay mills has gone down to 70, and the rest of India, which had only 80, has increased the number to 250, while Ahmedabad built 50 more mills. It is natural that Bombay and Ahmedabad should now install fine count machinery. Mills in and near the Indian ports specialize on finer makes because the use of ocean-borne foreign cotton does not entail extra internal freight charges and transport expenses to the consuming markets become less burdensome owing to the higher value of bales of finer cloth. This progress is on sound economic lines. In Southern India, which is being industrialized through the installation of a large number of mills, huge tracts of land growing superior varieties of cotton and a large population engaged in handweaving have contributed to the prosperity of the spinning mills in those parts. Similarly, in Northern India where spacious textile markets exist and where cotton from American seed is largely grown, the number of mills bids fair to be very much on the increase. Central India and the Central Provinces have a fair number of mills and scope for further extension should be a matter of close scrutiny. However, the most remarkable progress is made in Indian States owing to various concessions offered by the rulers, including remission of taxation, and owing to much less stringent rules and regulations of the Factory Act. When the industry in British India was in the throes of depression in the past ten years the number of mills in the States has gone up from 43 to 65, paid-up capital from Rs. 41 crores to Rs $6\frac{1}{2}$ crores, spindles from $8\frac{1}{2}$ lakhs to $12\frac{1}{2}$ lakhs and looms from 16,000 to 28,000.

Has Saturation Point Been Reached?

As the textile industry directly supplies 4,500 million yards for consumption and indirectly another 1,500 million yards in the shape of yarns sold to handloom weavers, the conclusion may be drawn that it has reached the point of saturation, since India's dependence on foreign imports is reduced to 600 million to 700 million yards or roughly 10 per cent. of the total. This is far from being the case as the Indian population increases annually on an average by 50 lakhs, which means additional yearly demand of another $7\frac{1}{2}$ crore yards of cloth. To meet the extra demand we have to make fresh extensions or add, say, 10 new mills every year of the average size of 20,000 to 25,000 spindles and 500 looms. Of course, there is no mathematical precision about it and naturally the increase in the producing capacity takes place by fits and starts. On the top of this, people are gradually taking more to the use of textiles for household purposes like tablecloths, napkins, sheetings, window curtains, etc. It can be reckoned that out of the total Indian consumption, 80 per cent, is for clothing purposes and only 20 per cent. or roughly 1,000 million yards for other domestic uses. There is great need to popularize, either by advertisement or by propaganda, the use of textiles for household purposes Take one instance alone. In India there must be at least a thousand million doors and windows. These may be of a very crude sort in the villages Still, if they are draped not only with an ornamental but also with a useful object to keep out sun or draught to the extent of only one yard per year at a small cost of 2 to 3 annas, India will require at least the same additional quantity that is now used wholly for domestic purposes In other words, to produce a thousand million yards of curtain another 100 new mills will have to be put up.

Finance

It may interest the readers to know that the total cost of installation by 400 Indian mills controlling 1 crore spindles and 200,000 looms in addition to dyeing, bleaching and printing machinery practically runs into Rs 100 crores. A part of this money is being raised on loans and deposits, and if the industry with such a huge stake is to be preserved for the future in a sound state, nothing should happen to shake its financial foundations. In order to ensure a progressive growth and to attract moneys towards it, capital has to be well remunerated. Nothing is to be deprecated more than the attitude taken up by the various Committees of Inquiry sponsored by Provincial Governments wherein the wage problem alone is given undue prominence. Had the question of dividends and liabilities of managing agents been given sufficient weightage, it would have been found that in the last 15 years crores of rupees have been lost and the flotation of new concerns has been looked upon as risky business.

Labour

This naturally brings us to the question of labour which is a factor going a long way to determine the destiny of this industry in the future. We have now reached a stage when the exactions of labour cut across the expectations of capital. When it is remembered that wages account for 25 per cent. and cotton, stores and fuel form another 60 per cent. of the manufacturing charges, very little is left for the accommodation of charges like interest, insurance, depreciation, taxation, office expenses, dividends, commission, etc. The industry is likely to be made to bear the brunt of social schemes like pensions, holidays with full pay, etc. A programme of thorough rationalization is therefore imperative. Otherwise, sale prices of textile goods will have to be raised beyond the purchasing capacity of India's poor consumers

Why Japan Undersells India

What is the principal reason why Japan can undersell in the Indian market? Whereas here in India we employ 450,000 operatives to work into textile fabrics about 35 lakhs of cotton bales annually, only 190,000 Japanese workers handle this quantity. The following figures of Japanese industry will prove very interesting and instructive:—About 15 years ago Japan had 250 mills containing 55 lakhs spindles and 65,000 looms, employing 230,000 hands. The number of cotton bales spun and woven was a little over 20 lakhs annually. To-day the number of mills has increased to nearly 300,

the number of spindles to 1 crore 20 lakhs, looms to 1,10,000 and cotton consumed to 35 lakhs of bales But the number of workers has gone down from 230,000 to 190,000 These 190,000 handle the products of as many cotton bales as are annually consumed by the Indian mills where 450,000 workers are employed. Really speaking, the figure of Indian textile employees is much larger than 450,000 because a considerable number of mills are on night work, and so far as I understand, the above figures, taken from the Millowners' Association's statements, does not include night employees. The quantity of cotton consumed by Indian mills does take into account both day and night work. Hence great scope exists for rationalization in India which will have to be achieved if the industry is to flourish in the future The total wage bill in Indian mills is now approaching Rs. 20 crores annually. By a gradual reduction of our labour force to 200,000 we shall be in a position to raise individual wages and at the same time effect a saving in working costs Under these conditions industry will receive a great stimulus and thus be able to absorb labour that will have been displaced through rationalızatıon

A comparatively well paid labour force—provided labour is entitled to extra earnings and does not claim them without putting in hard work-gets accustomed to a higher standard of living and becomes endowed with a sense of responsibility which, to my mind, will be the principal factor in crippling the strength of the great majority of Communist unions which flourish on the ignorance of textile operatives. Trade unions on economic lines can thus be developed and workers who are specialists in their own departments can well take charge of the appropriate departmental activities of such unions. Mr. Bevin's scheme for imparting knowledge of trade unionism to Indian workers at its very source in England and thus helping the industrialization of this country with a good trade union conception is likely to go a long way to ensure peace and progress in industries Whether Communists or not, the trouble with the Indian trade union leaders is that in a great majority of cases they have no knowledge whatsoever of the textile industry and cannot therefore judge labour problems in their true perspective.

Benefits of Protection Reduced

There are other factors also which vitiate the amount of protection supposedly enjoyed by the Indian textile industry The import duty on foreign cotton, stores. machinery, acts as a sort of subsidy to exporters of foreign textiles to this country. When India will be selfcontained as regards these items we shall be undoubtedly better off. Fortunately, in the field of cotton production this country has made considerable headway under the energetic guidance of the Indian Central Cotton Committee. Although the problem of production of staple over 1 inch, which has to be imported from overseas, has not yet been tackled on a commercial scale, the present annual outturn of nearly $2\frac{1}{2}$ lakhs of bales of cotton of 1 inch staple and of 15 lakhs of bales of 7 inch to 31 inch staple, mostly grown in the Punjab. has improved considerably the supply situation for the weaving of medium counts from 20s to 36s. Another 8% lakhs of bales with staple varying from % inch to mch find a ready use in the outturn of cloth on the coarser side. All these varieties described above constitute 50 per cent. of the Indian cotton crop. The supply position for expanding the production of the popular piecegoods varieties is therefore very promising.

INDUSTRIAL DISPUTES AND THEIR SETTLEMENT

Ву

T. V. BADDELEY, J.P.

THE history of the relations between the employers and workers in the cotton mill industry in India during the past two decades makes doleful reading. Disastrous and repeated strikes occurred in several centres of the industry, resulting in severe losses to both Capital and Labour, and in great hardship to the individual worker and his family

The only comparative exception to this state of affairs has been the city of Ahmedabad in which centre serious disputes have been few and usually confined to single mills. The credit for this state of affairs is due to a well-managed union and a system of arbitration backed by the personal influence of Mr. Gandhi himself. The case of Ahmedabad deserves more than passing mention. The union in that important centre was, and probably still is, the only trade union in any industry in India which has been consistently well managed and which, by its conduct of affairs, has maintained not only complete control over the actions of members but has also retained the confidence of the employers. The arbitration proceedings were at times very dilatory but the eventual results were acceptable, lightning strikes were very few and, at the expense of slightly higher wages for a short period, Ahmedabad enjoyed industrial peace The mills prospered and were modernized, while their Bombay neighbours were reduced to a state from which a number never recovered, through a series of protracted Communist-led strikes.

In every other centre of the industry workmen's grievances or fancied grievances were settled by means of lightning strikes and a fight to the finish. It was the exception for grievances to be put forward before a strike, the so-called unions had no control over the men and were unable to speak with any authority. This state of affairs prevailed not only in Bombay but in other centres of the industry in both North and South India. Matters were undoubtedly aggravated in many cases by managements, both European and Indian, being out of touch with labour, unconscious of minor abuses of authority on the part of supervisors in the mills, and at times unreasonable in their attitude to real grievances. While mentioning this, however, one must also record the rather curious fact that it has been the well-managed concerns, those concerns in various parts of the country which have done most for the well-being of their operatives, which have usually suffered first and suffered most at the hands of the irresponsible labour agitator.

The epidemic of industrial strife reached a climax during 1928 and the Bombay cotton mill workers have lost more than Rs 6,00,00,000 of wages in the period of 12 years from 1928 to 1940. Several causes contributed to this state of affairs and these causes, together with the action taken by the Government of India and by the Provincial Governments from time to time in an effort to provide for the settlement of industrial disputes, will be reviewed in this article.

Almost every industrially advanced country in the world has created some form of machinery for the settlement of trade disputes and for ensuring industrial peace. The Legislative Series published by the International Labour Office contains a large volume of legisla-

tion with regard to conciliation and arbitration in industrial disputes in various countries. In England the system is based on voluntary conciliation machinery which has been set up by trade unions and employers' associations which have also agreed to submit to voluntary arbitration by an Industrial Court. It may be added that in England the workers and employers do not rely on statute. A number of decisions have been given from time to time by Industrial Boards and these decisions have built up the law in that country. Numerous committees and Royal Commissions have investigated the facts and formulated policies at various times, and there is also a large number of Acts of Parliament. In Australia, there are elaborate preliminary proceedings after which matters are subjected to compulsory arbitration. There is also compulsory arbitration in the Union of South Africa for workers and employers in public utility services. The Canadian system is well-known. It provides for conciliation machinery with special provisions regarding strikes and lockouts and for changes in conditions of service by employers and employees being declared illegal until the whole process of conciliation prescribed under the statute is gone through.

Before referring to the steps taken by the State in India with the object of securing industrial peace, it may be interesting to note the statistical data relating to the extent and incidence of industrial unrest in the country during the past 20 years. The following table sets out the general effects of industrial disputes in British India during the period of 19 years from 1921 to 1939 inclusive.

	Year		No. of disputes in progress	No. of workpeople mvolved	No of working days lost
				(000's	omitted)
1921 1922 1923 1924 1925 1926 1927 1928 1929 1931 1932 1933 1934 1935 1936 1937 1938			396 278 213 133 134 128 129 203 141 148 166 118 146 159 145 157 379 399	600 435 301 312 270 186 131 506 532 196 203 128 164 220 114 169 647 401	6,984 3,972 5,051 8,730 12,578 1,097 2,019 31,647 12,165 2,261 2,408 1,922 2,168 4,775 973 2,358 8,982 9,198
1939	••	• •	406	409	4,992

The year 1928 is outstanding in the history of Indian industrial unrest, and the loss in time reached the record figure. The four years after 1928 showed a remarkable decrease in the intensity of industrial conflict until in 1932 the number of disputes on record was the smallest since 1921, in which year statistics were first collected. In 1935 the low record of under a million working days lost, was touched, but this position was not maintained in the subsequent years when the number of strikes as well as the number of days lost rose again.

Bombay has the unenviable distinction of heading the list, both in point of the number of workers involved and in the total number of working days lost, through industrial disputes during the past 20 years. The cotton mill industry in Bombay City has been by far the worst sufferer in this respect.

A study of the settlement of industrial disputes in India and particularly in the Bombay Province falls under four distinct periods. These four periods are from 1920 to 1929, i.e., before the introduction of the Trade Disputes Act in 1929 by the Government of India; from 1930 to 1934 when the Bombay Trade Disputes Conciliation Act was passed by the Government of Bombay; from 1935 to 1939 which is the period when the Bombay Act was in operation, and lastly a period of 14 months following the enforcement of the Bombay Industrial Disputes Act in August 1939

Before the passing of the Trade Disputes Act, there were occasions on which conciliation or arbitration was undertaken by individuals or by specially appointed committees The first attempt to settle disputes by the appointment of more or less formal bodies was made in Madras in 1920 when on four occasions Courts of Inquiry were appointed consisting of an official chairman and one member chosen by each party. Committees of a similar character were instrumental in terminating two strikes in Bengal in 1920 and 1929. The problem of industrial unrest had become so acute, however, in 1921 that the Government of Bombay for the first time appointed an Industrial Disputes Committee, which was presided over by Sir Stanley Reed. This Committee was asked to consider and report upon the practicability of creating machinery for the prevention and early settlement of industrial disputes. The report of this Committee mentioned four or five factors which, in their opinion, were responsible for the industrial unrest, and they vividly described the conditions which then existed. One main factor was the frequency of strikes without notice. The second was the absence of any definite declared grievance before the strike, and the multiplicity and extravagance of the demands put forward after workers had resorted to a strike. The third factor was the absence of any effective organization amongst

After considering the Reed Committee's Report, the Government of Bombay proposed to enact a measure to provide for industrial conciliation, but as the Government of India decided about that time to introduce legislation on an all-India basis, the Government of Bombay dropped their proposal. In 1924 a strike in the cotton mills in Bombay occurred, due to the non-payment of a profit bonus which had been paid in the years 1919-22 and which, according to the labour leaders, should have also been paid in 1923. The matter was referred to a special Committee of Inquiry presided over by Mr. Justice MacLeod whose findings were entirely in favour of the millowners. The publication of the MacLeod Inquiry Committee's Report directly brought about the collapse of the strike.

The year 1928 was a memorable period in the annals of Indian industrial unrest. The Bombay cotton mill industry suffered from a most disastrous strike during that year, involving a complete cessation of work for about six months. This strike was declared without labour formulating any demands, but the string of demands and grievances grew in length and magnitude as the days passed on. The events of 1928 clearly showed that labour in several industries and industrial centres had fallen into the hands of extreme Communist leaders

who exploited it entirely for their own ends. The principles of communism were disseminated amongst the working classes by the members of the Workers' and Peasants' Party which was an agent in India of the Communist International. The Communists usurped the leadership of the working classes within a short period and were able to assume control over the executives of the existing textile and railway unions in Bombay, Madras and Bengal They painted the existing conditions as black as possible and promised wealth and happiness under a dictatorship of the workers and peasants. There was incessant preaching of violent revolutionary doctrines, and the credulity and illiteracy of the Indian worker made him an easy victim to these emissaries of revolution who taught him class hatred and instilled in his mind complete disrespect for law and order. These irresponsible agitators had no knowledge of the industry, were not workers themselves and were not concerned whether an industry was ruined or not To improve the operatives' working conditions and remuneration was the last thing in their minds.

After six months of complete cessation of work, the Government of Bombay appointed a committee under the chairmanship of Sir Charles Fawcett to report, not on the causes of the strike, but upon the fairness of the Standing Orders for operatives and the Standardization Scheme of Wages prepared by the millowners.

The line of demarcation between the first and the second periods is the passing of the Trade Disputes Act by the Government of India in the year 1929 The first action taken under this Act was the appointment of a Committee of Inquiry presided over by Justice Pearson to inquire into the causes and origin of the strike which had been declared by the Bombay Girni Kamgar Union, while the millowners were discussing with the representatives of labour the recommendations of the Fawcett Inquiry Committee and endeavouring to secure their co-operation in the introduction of Standing Orders and the Standardization of Wages Scheme.

The report of the Pearson Committee which was published towards the end of 1929 was a scathing indictment of the tactics of the Communist leaders of labour and was an eye-opener to many who still innocently believed that labour and its leaders were being unnecessarily stigmatized.

The Trade Disputes Act, 1929, divides itself into three parts. The first provides for the appointment of Courts of Inquiry and Boards of Conciliation. The second contains special provisions with regard to strikes in public utility services and the third deals with illegal strikes and lockouts. The first part of the Act relating to the establishment of tribunals for the investigation and settlement of trade disputes is based generally on the British Industrial Courts Act of 1919, the main difference being that, while the British Act sets up a standing and permanent Industrial Court, the Conciliation Boards which the Trade Disputes Act makes provision for are intended to be appointed ad hoc in order to deal with particular disputes. The Government of India or the Local Governments are empowered to refer any trade dispute which exists or is apprehended. to a Court of Inquiry for report, or to refer the whole dispute to a Board of Conciliation for promoting a settlement thereof. It is a matter entirely at the discretion of Government to appoint or not to appoint a Court of Inquiry or Board of Conciliation in cases where no reference is made by either party or where a reference is made to Government by only one party. In cases where both the parties to a dispute apply either conjointly or

THE IMPROVEMENT OF COTTON VARIETIES IN INDIA

Ву

W. BURNS, C.I.E., D.Sc.

Agricultural Commissioner with the Government of India

G. WELLS started his famous "Outline of History" with the nebulæ that existed before the solar system. The present writer could not, if he would, go back so far. Nevertheless, by our little human standards, the cotton plant has been on the earth in a wild state for a very long time. Truly wild species of cotton are found in all continents except Europe. All these wild species and all the more primitive forms of the cultivated species are perennial, and it is only in historically recent times that annual types have become the backbone of cotton cultivation.

Probably the oldest authentic evidence of the use of cotton is to be found in the fabric unearthed by archæologists at Mohenjo-daro in Sind, some 200 miles from Karachi. This fabric was found adhering to the lid of a small silver vase, and the action of the silver had helped to preserve the cotton which would otherwise inevitably have perished. The fabric was examined at the Technological Laboratory, Matunga, and proved to be cotton. It is thus certain that cotton was in use in the Sumerian civilization of Mohenjo-daro about 3000 B.C. The cotton is like some of the very coarse cottons of the present day.

After that there is a long gap. In early literature there is little mention of cotton, the earliest date on which we have a definite reference being about 800 B.C. It seems that Greek travellers and others had by the beginning of the Christian era given fairly vivid pictures of India as a cotton-growing and cotton-manufacturing country. About A.D. 1290 Marco Polo, the famous Italian traveller, described the production and manufacture of cotton in India

To improve the quality and extend the cultivation of Indian cotton, the Court of Directors of the East India Company secured the services of twelve American cotton planters who arrived in 1840 and were distributed to various parts of India. From the American cotton seed which they brought with them and planted, have finally sprung some of the American varieties now in cultivation in India, such as Dharwar-American (or Saw-ginned Dharwar). This Dharwar-American also found its way into the Punjab, and from it have been selected certain of the improved types of American cotton now in cultivation in the Punjab. Other improved Punjab types are believed to have a different origin (i.e., from the so-called "Narma" cotton, remnants of American cotton seed of a different importation). Another important cotton of American type is "Cambodia," obtained direct from the French territory of that name in 1905. As is well known, this has become important in Madras and in certain other areas.

The Provincial Agricultural Departments, which took their present shape about 1907, devoted much time to the improvement of Indian cotton and several of the larger States did the same. A landmark in the history of cotton improvement in India is the Report

of the Indian Cotton Committee in 1919. This Committee went thoroughly into the requirements and state of progress of cotton improvement in each cotton Province and State throughout India and made most valuable suggestions for future work

Indian Central Cotton Committee

One of the results of this report was the passing of the Indian Cotton Cess Act in 1923 and the consequent setting up of the Indian Central Cotton Committee. This body, representing all cotton interests throughout India, and meeting twice a year (generally in Bombay but sometimes in important cotton centres outside Bombay) has had a continuous record of usefulness. This Committee has had a stimulating effect on cotton improvement in a variety of ways. In the first instance, it has liberally financed research work not only on the production of new and improved varieties (though that has been the main line of work) but also on the study of pests and diseases, on seed distribution and on the investigation of marketing and the costs of production. Secondly, it has functioned as a means of sifting, criticising and correcting schemes for scientific and other work, and in this activity all the elements of the Committee have taken their full share. Thirdly, it has looked ahead and tried to foresee developments and requirements and to organize the work of the scientists accordingly. Fourthly, it has been instrumental in helping on useful legislation concerning cotton. The Indian Central Cotton Committee has also undertaken the greater part of the finance of the Institute of Plant Industry at Indore, and valuable work has been done there on the study of the inheritance of various characters in cotton, and on cotton cultivation and its problems. The Committee also maintains the Technological Laboratory at Matunga, where research on cotton technology is carried on. The fibre and spinning tests made at this Laboratory indicate at an early stage the suitability or otherwise of new strains.

The excellent research work that had been begun before the Committee came into being has therefore been much intensified. This is no reflection on what was done before it started, such as the early work of Gammie and others (in Bombay), Milne (in the Punjab), Henderson (in Sind) and Leake (in the United Provinces).

We may now deal with a few of the lines on which cotton improvements have taken place, and the first and most important of these is the production of better races of the cotton plant by means of plant breeding.

Plant Breeding

It may not be out of place to give a short summary of how plant breeding is carried out. The crop as grown by the cultivator is in most cases the raw material for the plant breeder's work, and the first process he applies is the one called *selection*. One plant differs

from another and he picks out those which seem to have the qualities he is looking for, and from them he breeds better races. This sounds simple, but is far from being so. A plant that seems better may be only accidentally so on account of its favourable position in the field or on account of some favourable accident at the time of sowing or on account of escape from insect attack. This is the reason why plant breeders never mix the seeds of their selected plants. They follow the progeny of every single selected plant through several generations, keeping it quite pure, and from time to time they reject those which are not up to standard or are breaking up into several types. At last the plant breeder arrives at a stage when he has one or more so-called "pure lines," to each of which he has given a letter or number or combination of these. To keep seed pure, it is necessary to prevent the flowers from opening and being cross-fertilized by insects Cotton breeders use a number of ingenious devices for this purpose One sews the petals of the bud together, another puts a little ring of wire over the bud, and still another seals the bud with a wet clay.

The next stage is the testing of these pure lines against the local variety which they are to replace and against one another. This again appears simple but is actually difficult, and a whole technique of field experiments is employed, based on the mathematics of probability (the same kind of mathematics as used by actuaries). Generally, before the final stage and along with the last years of field experiment, parallel experiments are carried out on the fields of cultivators so that the end result may be more reliable and the more rigorous conditions of actual farming may be allowed full play on the races under trial. After such experiments a single pure line is chosen and this is then multiplied and distributed. It sometimes happens that selection is not enough. Something is missing from the race that has been evolved and must be added. The plant breeder does this by crossing the race with another which has the desired character and then continuing his selection among the hybrid progeny. A striking example of this is the history of the now wellknown Jaywant cotton. About 1913, the Cotton Breeder at Dharwar had produced a pure line called Dharwar I. This was a race which gave an increase of 10 per cent. in yield over the local Kumpta, an increased ginning percentage of 3 per cent, and a greatly increased value in rupees per candy. At the height of its popularity this strain of cotton covered 160,000 acres in the Southern Mahratta country. But, when cotton wilt showed itself as a serious disease about 1920, this otherwise excellent cotton proved susceptible to the disease and, if no remedy had been found, would have been wiped out. But the Cotton Breeder had among his other pure lines one (later called Dharwar II) which proved to be very wilt-resistant, and he crossed it with Dharwar I. From the progeny of the cross, he finally produced, about 1926, the race which the present writer, in 1930, named Jaywant (= victorious) in celebration of its victory over wılt.

It will be seen from the above that plant breeding is a slow process, and needs continuity over years in order to produce results.

Results Obtained

Let us consider a few of these results in other parts of India. It is impossible to deal with what has been done in all Provinces and States so that only a small typical selection of achievements can be mentioned. Here are some of them.

In the Punjab, one of the earliest successes was the breeding of the 4F variety of American cotton. This is a rough-leaved Upland American type selected from the so-called Narma cotton, i.e., the early introduced American cotton (not Dharwar-American). Its ginning percentage is 32, and when unmixed, its staple is 3 to 3 inch, fairly strong and regular. The longest and finest of the Punjab-American cotton varieties is 289F with a staple of one inch to one and a thirty-second inch. A sub-selection from this made on the estate of the British Cotton Growing Association at Khanewal, with a higher ginning, is now called 289F/K25. Another selection, viz., 289F/43 is also very popular in certain parts of the Punjab. It is early maturing and resists drought and Jassids. From 289F was also derived the variety now known as Sind Sudhar, which is a strain selected in and suited to Sind conditions, with a staple of one inch and a ginning percentage of 29. The area under this is rapidly increasing Cotton development in Sind was made possible by the Sukkur Barrage. The Indian Central Cotton Committee is now financing new research intended to produce still longer staple cotton in Sind, using for this purpose all the varied knowledge now at our disposal and bringing in varieties likely to be useful for crossing from other parts of the world.

In the Punjab, *deshi* cotton has also received attention, and one of the recent successes there is the strain which has been called Jubilee (from its having been first distributed in the year of the late King George's Silver Jubilee). This strain is a cross between Punjab Mollisoni and Chinese Million Dollar and has a staple length of $\frac{7}{8}$ inch and a ginning percentage of 34. The selected Desi cotton variety Mollisoni 39 is very popular in the Central Canal colonies

In the Bombay Presidency a recent success is Jarila, which is the name given to a cotton selected from the *Verum* sub-section of the species *Gossypium neglectum*, a component of the old "Khandesh mixture." Jarila is a medium-stapled cotton of short season suitable for the replacing of the short-staple cotton in Khandesh.

Some good work has been done in both Hyderabad and Mysore States. In Hyderabad some of the Gaorani selections are outstanding and in Mysore there is a line of cottons, the so-called M.A. (Mysore-American), which have very good qualities. In the Central Provinces the outstanding success has been the Verum cotton which now has a standing all of its own. In Madras, striking success has been obtained in the production of Co.2, a selection from Cambodia, with a one-inch staple, and there is a lot of work going on there in other types with successes in several directions. One or two special directions in which plant breeding has been a success and in which the most modern scientific knowledge has been utilized are worth mention. One of these lines is the discovery of how to get cotton plants absolutely immune to cotton wilt. Wilt-resistant strains evolved by the ordinary plant breeders' method are never entirely free from wilt-affected plants and the percentage of such in a bad season may be considerable. A special technique based on our knowledge of heredity and on a process which permits of maximum infection, weeds out all the plants except those which are completely immune. On the basis of these few can be built a completely immune strain.

Another recent fascinating line of work is the production of new races from the crossing of American and Indian cotton varieties. For years this was considered impossible, and the reason was known, i.e., important differences in the structure of the cells that

(Continued on p. 219)

RATIONALIZATION IN THE TEXTILE INDUSTRY

Βv

Sir SHRI RAM, Kt.

THE popular conception of "rationalization" associates the term with a better order of things; how exactly that better order is to be brought about is rather vaguely understood. So far as the textile industry is concerned, it would appear that rationalization is conceived largely in terms of an intensification of a worker's individual effort, of improving the volume of his output and the quality of his performance. Actually rationalization is or should be wider in its scope. Although the dictionary defines the term as the "scientific organization and management of industries, co-operation between employers and employed and application of exact scientific experiment in every department of production," rationalization is applicable to the entire field of industry, from the putting up of a factory until the manufactured product is in the hands of the ultimate consumer.

At no time, perhaps, has the necessity of considering the question of rationalization been more urgent than at present. The object of rationalization is the lowering of the cost of goods. Trite as it may seem, it is an elementary economic dictum that if things cost less people buy more of them; when people buy more things, more things are made, and when more things are made, more men are employed. Our productive capacity is still short of consumption as it should be. The textile industry is India's largest industry; it employs about 500,000 workpeople. If the 400 million inhabitants of this country cannot provide an occupation for this number and keep the industry profitably going, it would appear that even after making a very large allowance for the extreme poverty of the people, their very simple tastes and their self-denying habits, some defects still exist in the industry which call for rectification. The remedy for these defects lies in the mobilization of the industry's entire economic front. Even when mills make a profit it is not necessarily an indication that the last stage in efficiency has been reached. When the textile industry in other competing countries has been highly rationalized, it behoves us to introduce rational policies by deliberate planning and by improved organization so as to make our mills fully co-ordinated units.

Producers' problems are many and complex but the integral parts in any scheme for the improvement of the economic efficiency of the industry, for that is what rationalization implies, are the following.

Location of the Industry

Rationalization as applied to the location of an industry consists in the erection of factories in places which command as many of the following natural advantages and facilities as possible: proximity of raw material resources, the existence of a large market for the manufactured products, availability of skilled labour, cheapness of suitable land for the factory, for housing the workers and for the provision of other amenities for them, facilities for export, availability of means of communication and transport, of cheap power, etc. Although it is true that some of these advantages can artificially be either increased or diminished by administrative policies such as the manipulation of freight

rates, the exemption from or the imposition of heavy local taxation, etc., no administration but a short-sighted one would seek to interpose obstacles in the way of an industry, for industry brings in revenue to Government and the local authorities, provides two-way traffic to transport undertakings, furnishes employment, direct and ancillary, and leads to increased business activity. Care and thought bestowed on the location of a factory and a meticulous assessment of the advantages of possible sites before selection will have not a little bearing upon the subsequent fortunes of an industry.

Rationalization also involves the provision of more and highly mechanized plant and equipment. Intensive mechanization helps to reduce costs as does replacement of old and obsolete machinery by new and improved ones In not more than a few of the mills, if in any at all, can it be said that the optimum of mechanical efficiency has been reached. Rationalization as applied in this sphere would require the purchase of the best machinery at the most economical price. Textile machinery manufacturers have in recent years established in India a combine which has resulted in the elimination of a competitive market for machinery and in the raising of prices. If textile mills, conscious of what constitutes the general interest, can appreciate the advantages of uniting their individual interests for mutual benefit, they should set up a purchasing organization for covering their requirements not only of machinery but of stores and spares, for a central concern can purchase more profitably If a non-commercial undertaking such as Government has felt the need for and experienced the advantages of, a central organization for the purchase of the stores requirements of its several departments, how much more important and necessary would an institution of that kind be for a profit-earning undertaking. Stores and spares constitute a not inconsiderable item in the budget of expenditure of running a mill, and economies effected in this direction will help to reduce manufacturing costs. A purchasing organization would not only be useful in saving costs but in obtaining articles of the necessary standard and requisite quality. Machinery and parts and spares would not then be bought until they have been carefully examined by experts and until details of their performance have been found to be satisfactory. Few mills are adequately equipped to conduct a test of these articles, and individual arrangements made for this purpose may be disproportionately costly and joint action offers a far more economical and satisfactory solution besides being a saving in time and eneray.

Raw Cotton Purchase

If rationalization is necessary in any part of the industry, nowhere would it appear to be called for in a greater degree than in the purchase of raw cotton. Here again co-operative effort holds appreciable advantages to individual mills. Few mills have either a reliable knowledge of world conditions affecting the cotton trade or have any systematic policy for buying cotton with the result that they expose themselves to exploitation by speculators. The activities of the speculators are (Continued on p. 235)

MILL STORES BUSINESS FIFTY YEARS AGO

By

Sir HOMI MEHTA, K.B.E.

T affords me great pleasure to contribute an article on "Mill Stores Business" to the Golden Jubilee Souvenir of the *Indian Textile Journal*.

About 50 years ago I started my career in mill stores business. In 1889 I served my apprenticeship with Messrs. D. R Umrigar & Co Bombay, and in 1896 I started the business on my own account with the late Mr. Mangaldas Girdhardas Parekh, the well-known mill magnate of Ahmedabad. There were then a few mills in Bombay and hardly 10 mills in Ahmedabad Those were glorious days! There was little or no competition. The dealers' knowledge of mill stores was negligible. Managers, weaving masters, spinning masters and engineers of mills knew little about the quality of the stores they bought. Many managers and weaving masters in those days, in order to make money, gave several articles spurious names to hoodwink the mill agents and so both the dealers and themselves made a lot of money by this method. But those who traded in such dishonest ways had short careers; they rose and fell and the money went the same way as it came. Only those who worked hard survived. Most of the old firms who were trading largely in mill stores have disappeared, such as A. S. Narielwalla & Co., M M Bottlewalla & Co., MacBeth Bros., D. R. Umrigar & Co., M S Kheswalla & Co. These firms at one time or another were doing business on large lines The survivors are Greaves Cotton & Co., W. H. Brady & Co., N. N Wadia & Sons, Gannon Dunkerley & Co. and H. M. Mehta & Co. Hundreds of new firms were later on started, some have gone down, some have survived In the olden days the profits were large and the quantities to be supplied were less on account of fewer mills. It was not then easy to sell the stuff unless you worked hard. There were no motor cars in those days. The richer firms had their own shigram carriage and horse. The smaller firms had to satisfy themselves with tram-cars which were then drawn by horses. Time was of little significance and the salesmen had to start their work before 8 a.m. It took an hour to go to Grant Road or Byculla which were the termini of tramways; from there the salesmen had to walk to the mills at Tardeo, Chinchpokly, Parel and Sewri. It was hard work walking in the blazing sun and in monsoon pools. The only protection was a huge bulky umbrella. Raincoats were not in existence. When I look back on those days it amuses me.

Talking about personal experience, I had to work my way up, my pockets laden with samples of beltings, bandings, bobbins and what not, with a huge tarpaulined umbrella which served its purpose both during the sunny days and monsoon time. Heavy boots, weighing over 3 lbs. were on my feet, well spiked, so that they might not be worn out quickly. I wonder how many young men of the present generation can carry that weight on their feet. The umbrella which one had to carry weighed over 2 to 3 lbs. was bamboo-handled, and had thick iron spokes and tarpaulin cover. In the monsoon one had to take out one's boots and hang them on one's shoulders, also to roll up one's trousers high over the knee-caps. In this way one had to trudge on to sell

his wares—sometimes with good results and many a time with no result. The saleman's job now is quite comfortable compared to the olden days. As the mills increased in number the mode of conveyance was also accelerated. In Ahmedabad the conditions were awful —only one straight road, the Richey Road, was metalled, all others were katcha roads and the mills were built in fields. One had to ply there in tongas which often stuck in sandy fields. It was really heart-rending to see the horses trot through dust and sands. In the monsoon the vehicles got embedded in thick slime and mud and many hours passed before the wheels could be made to move again. Such were the conditions of those old days, when inquiries were few and far between and one had to go from mill door to mill door to sell one's wares or else to close down one's shop.

Mill stores and machinery importers of 50 years back had their own troubles and difficulties Their greatest trouble and difficulty was the exchange which used to fluctuate from date to date and ranged from 5 per cent to 20 per cent. Many, ordering their consignments had to fight against that and many firms used to prosper or go down according to the vagaries of luck. Later on the exchange was fixed at 1s 4d to a rupee, then only the importers had breathing time and the trade became normal. In those early days the methods of office routine and management were on crude lines and each one carried on his business in his own way. Those who had vision certainly succeeded over others. There were practically no typewriters, and the few that were in use were considered a luxury rather than anything else. There were no shorthand-writers and correspondence was carried on by hand. No merchant would dare to divulge the names of the makers from whom he made purchases even to his staff, and the entries in the books were kept in fictitious names. Invoices were kept in safe custody by the merchants, and as much care was taken of them as of ornaments and jewels. Some merchants would even go to the docks to clear the goods themselves instead of handing the invoices to the clearing clerk. There were no clearing agents then and every merchant had his own clearing man who, nine times out of ten, was his own brother or close relative.

Most of the business was done not on the relative merits of the goods to be supplied but by influencing mill agents and managers. Salesmanship played a great part, but influence and not merit was the determining factor.

In those early days the representatives of British and Continental firms were beginning to visit India in small numbers. There was a trio who used to come every year or every second. It consisted of Mr. W Ingram, representing Wilson Bros. (Bobbins), Mr. Peter Eadie, representing Eadie Bros. (Ring Travellers), and Mr. Johnson, representing Sykes Bros. (Fillets). They were always coming together and going back together Each one influenced the sales of his wares and helped others similarly. These gentlemen always had a good (Continued on p. 34)

REMINISCENCES OF AN OLD-TIMER

B۷

Sir CUSROW WADIA, Kt., C.I.E.

 ${f N}$ R. JAL RUTNAGUR has asked me to write a few reminiscences of the early days of our cotton industry. So I accede to his wishes with pleasure. I have been connected with the Bombay cotton mills since the year 1888 Shortly before that year the Victoria Jubilee Technical Institute was started. My father was Honorary Secretary thereof I became friendly with the Professor by name Hugh Monie who lectured to the students on cotton and cotton machinery. He casually mentioned to me one day that Mr. Rutnagur was going to start a textile journal. That must have been in July 1889. Shortly after that I saw these two worthies in deep discussion in a victoria on Hornby Vellard I assumed, therefore, that the Indian Textile Journal was about to be hatched. The first number, if I mistake not, was published next year, and from the word "go" it seems to have had a great success and now, after more than half a century, it is still the premier cotton journal of India. My hope is that it may grow from strength to strength and be its robust self after another 50 years

The Millowners' Association was started under the ægis of Sır Dinshaw Petıt ın the early eighties and he was the Chairman of that august body for some six years He was a great personality and a supreme judge of men and their capacities for work. He was able, therefore, to surround himself with energetic and able collaborators who made the Petit group of mills most successful, and Sir Dinshaw a very wealthy man. The group consisted of the Maneckjee Petit Mills, the Dinshaw Petit Mills, the Mazagaon Mills, the Framjee Petit Mills' the Bomanjee Petit Mills and the Victoria Mills. My father was connected with the first, second, fifth and sixth on this list. The way he first came in contact with Sir Dinshaw was owing to the bursting of a cylinder of the old beam engine at the Maneckjee Petit Mills. All the consulting engineers who examined the breakdown were of opinion that the fracture was due to water hammer. He thought otherwise and insisted that it was due to the wearing down of the beam bearings. The matter was referred to the makers of the engines -Hick Hargreaves & Co.-and they upheld my father's views Thence began his association with Sir Dinshaw (1872) which only ended with his death in 1899. My brother and I carried on the connection for a couple of years longer as we were loath to break such a longstanding collaboration. However, Mr Bomonjee Petit, much to our relief, on his own initiative said he thought we were overworked with our own concerns-the Textile and Century mills—and considered it best for all parties to separate So ended our long connection with the Petits, about 1902 I think.

I well remember the great reputation Mr. Jamsetjee Tata enjoyed owing to the success of his Central India Mills towards the end of the last century. When I first saw him, he was a youngish-looking man for his age, not particularly striking or impressive Later he grew a patriarchal beard that gave remarkable character to his face. He was a great patriot and the originator of great schemes such as the Iron and Steel Works, the Hydro plants, etc., none of which reached fruition in his

lifetime. But his conceptions were sound and far-seeing and later they were constructed by his successors. They were great national works of immense benefit to this country, especially during the last war

My first acquaintance with the Millowners' Association was in the time of Sir George Cotton. He was a gentleman of much weight, facile tongue and convincing argument but when he wanted to nominate his successor I had to point out to him that the rules of the Association provided how this successor was to be elected, and so it was done I think the most forceful personality of my time in the Millowners' Association was the late Sir Dinshaw Wacha. He did a great deal of work behind the scenes and was a tower of strength in the committees. Those were halcyon times for us all. Steady profits, steady labour, no strikes and, above all, no stocks Then the Japanese barged in and things were not so good. After that came the war and the era of astronomical dividends and a gradually accelerated decline until the industry was to experience bad trade and worse profits for a decade or more. But all this is recent history known to all. So I need say no more about it.

In closing, one may say a word about the relations of Government with the industry. From the beginning the Government of India looked down on the industry as a stepchild. At the behest of the Home Government they placed bar and barricade against the mills. India is a land of agriculture and a producer of raw products. For a country to be really successful and self-supporting like France or the U.S.A. industries must balance agriculture. That is, you produce, manufacture and sell all within your own country The Government of India must have thought otherwise till recently, as they imported everything from a pin to a locomotive and it has taken two wars to make them begin to think differently. Let us hope that this change of heart and altered angle of view will be permanent and not for the "duration" only.

Mill Stores Business Fifty Years Ago- (Concluded from p. 33)

time together and by means of their humour they made good friends amongst mill managers and agents and thus used to carry back with them the bulk of the business. There were no hotels of outstanding importance and they used to stay at the Esplanade Hotel, next to Rajabhai Tower Gardens. This hotel is not now in existence. Cornaglia's tea-place was a favourite resort for afternoon tea, and a dinner at the Victoria Terminus station was enough to make them proud—a garland when they landed and another at their departure were enough to make them feel like lords; for these little courtesies they would go a long way to help one.

In spite of serious difficulties and limited knowledge, those were glorious days and, whenever my mind pictures the past, I feel happy and proud of what we had to go through.

HYDRO-ELECTRIC POWER FOR BOMBAY MILLS

(Contributed)

WHETHER the benefits of hydro-electric service would ever have accrued to the Bombay mills without the assistance of the late Mr. Sorabji M. Rutnagur, Founder of the Indian Textile Journal, will probably never be known Mr. Rutnagur with his clear vision and expert knowledge of the textile industry advocated, against strong opposition, the use of hydro-electric power as a means of increasing the efficiency and lowering the cost of production in the Bombay textile mills It is only fitting, then, that the introduction of an article on "Hydro-Electric Power for the Bombay Mills" should include this simple tribute to one who was so closely and vitally connected with the early history of its development.

History of the Tata Hydro Companies

Mr David Gostling, one of Bombay's best known architects during the closing years of the last century, conceived the idea of utilizing the heavy rainfall on the Bhore Ghats for industrial purposes in Bombay. There was one citizen who could appreciate the suggestion and carry it through and that was Mr. Jamshedji Tata. With characteristic thoroughness, he made a detailed study of Mr. Gostling's initial proposals, and developed them into an extended project which was to place the spinning and weaving mills of Bombay on a higher level of economy.

Mr. Tata by his enthusiasm had, prior to his death in 1904, made plans for a public utility on a large scale. He proposed to transform Bombay and Poona as well as the surrounding and intervening districts by an adequate supply of electric light and power. He visualised Bombay as a smokeless industrial centre. He also foresaw that electric traction on both the railway systems serving Bombay would revolutionize the convenience and cost of transport. The thoroughness of Mr. Tata's plans and the wealth of detail he had assembled enabled his successors to make these dreams come true.

Original Plans Crystallized

Most water-power schemes are suggested by visible potential energy in the form of a waterfall or the rapidly flowing section of a river. In the case of the Tata Hydro-Electric Project, water had to be impounded during the monsoon for use throughout the entire year. The mountains of Western India rise between 2,000 and 4,000 feet above sea level, and the annual rainfall at these elevations ranges from 100 to 400 inches. This water is precipitated during the monsoon season, which is of about $3\frac{1}{2}$ months' duration, and flows in torrents down the ravines and almost vertical slopes of the mountains westwards, while on the eastern slope the water that is not rapidly absorbed by the arid soil of the Deccan forms the source for several of those great rivers which flow into the Bay of Bengal.

With the assistance of Government topographical and geological maps and surveys, together with the records of Meteorological data which were then available, the Tata engineers selected the most suitable and economical locations for their undertakings. A feature, then unique in hydro-electric engineering, was made the basis of the project; this involved the diversion, for useful work, of water from the eastern to the western

water-shed This feature can be more fully appreciated when such diversion is explained by the fact that all the water used to-day by the existing three-power stations flows westwards into the Arabian Sea instead of eastwards into the Bay of Bengal, as would have been the case had these power stations not been constructed.

In the year 1905 Tatas secured European engineers who had experience of hydro-electric work on a large scale. They also secured the valuable support of Lord Sydenham, Governor of Bombay, and himself an engineer, so that by 1907 the Government formalities were completed and a license was obtained to supply hydro-electric power to Bombay.

As is common to all new ventures, great difficulty was experienced in selling the idea of electric drives from water power for the operation of the Bombay textile mills. To this end, Sir Dorabji Tata and Mr. Sorabji Rutnagur worked hand in hand for several years. It was from the beginning an uphill task. The Bombay millowners were not inclined to encourage the scheme but preferred to wait and watch the practical results of the electric drives in the local factories which chose to undertake the transformation.

Without tangible proof that the hydro-electric energy would be sold when produced and transmitted to Bombay, financing was a most difficult problem. Mr. Sorabjı Rutnagur persisted in his efforts to show that the electric drive was an advantageous and economic proposition. He secured authentic information and data from England and America which were placed before Sir Sassoon David and other millowners who were anxious to study the subject in the interest of the mill industry. The result was that Sir Sassoon David and Sir Shapurji Broacha guaranteed to take up a substantial portion of the initial energy for their mills. In addition to the guarantee, Sir Shapurji Broacha was influenced by Mr. Rutnagur's advice to help the financing of the scheme by underwriting the whole of the original debenture stock of Rs. 55 lakhs.

Sir Dorabji was, with untiring efforts, able to secure the necessary additional finances from native Princes and investors so that the Tata Hydro-Electric Power Supply Company was registered on 10th November 1910 with a nominal capital of Rs 2 crores.

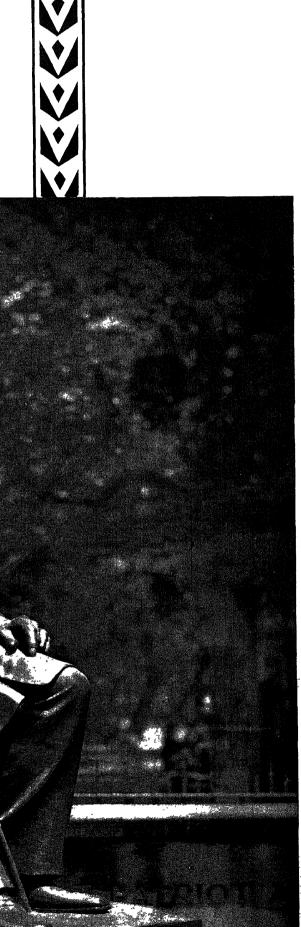
The entire Hydro-electric Scheme was worked out in the most minute detail by its promoters. In 1940, with the short cuts and aids of present-day engineering development and operating practice, it is an inspiration for the present officials of the Hydro companies to observe how accurately those plans were laid down over thirty years ago.

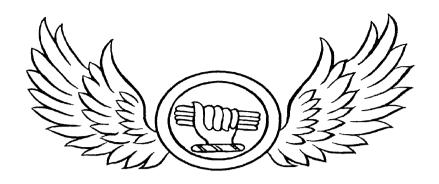
The Tata Hydro-Electric Power Supply Company Limited

The engineering and construction of the first hydro-electric unit presented many difficult problems. The hard Deccan trap-rock offered peculiarly strong resistance to tunnelling operations Doggedness on the part of the promoters and engineers, coupled with a labour force drawn from the most hardy workmen in India, resulted in the operation of Khopoli Station in 1915.

Khopoli Power Station is fed from a chain of lakes at Lonavla, Walwhan and Shirawta. The aggregate water

Jamsetji Nusserwanji Jata 1839—1904 Founder of the House of Tata, whose vision, patriotism and enterprise gave India some of her greatest industrial undertakings





industrial undertakings, and represent a capital investment of over Rs. 62,00,00,000. They give direct employment to over 85,000 people, pay Rs. 4 crores in wages, and contribute to the revenues of Government and Railways a total of over Rs. 4 crores. Tata-controlled and associated concerns cover the field of Iron and Steel, Cotton Textiles, Public Utilities, Heavy Chemicals, Cement, Air Lines, Edible Oils and Soaps, Insurance, Real Estate, Hotels and Finance.



TATA IRON AND STEEL CO., LTD. - TATA HYDRO-ELECTRIC POWER SUPPLY CO., LTD. THE ANDHRA VALLEY POWER SUPPLY CO., LTD. - - THE TATA POWER CO., LTD. THE CENTRAL INDIA SPINNING, WEAVING AND MANUFACTURING COMPANY, LIMITED. THE SVADESHI MILLS CO., LTD. - THE AHMEDABAD ADVANCE MILLS LTD. THE TATA MILLS LTD. - TATA CHEMICALS LTD. THE INVESTMENT CORPORATION OF INDIA LTD. - THE INDIAN HOTELS CO., LTD. TATA SONS LTD. AVIATION DEPARTMENT

surface of these artificial lakes is approximately 9 square miles. The dam which forms the Shirawta Lake is approximately $l_{\frac{1}{2}}$ miles long and has a height of 83 feet. It is entirely mountain-locked, and its waters empty into Walwhan Lake through a tunnel nearly a mile in length. Linking the Walwhan Lake, the Lonavla Lake, and the forebay (which is 1,725 feet above Khopoli Station) is an artificial river of masonry, spanning valleys and cutting through hills. The length of the aqueduct is approximately four miles

Work was begun on the Lonavla Dam in 1911, and in 1915 the first current was flashed over the transmission lines to operate the spindles of the Simplex Mills in Bombay.

The Andhra Valley Power Supply Company Limited

The second hydro-electric unit was promoted in 1916, and war-time difficulties hampered its beginning. The power station of this unit is supplied by a single lake, water for which is provided by a catchment of over 48 square miles. The Andhra reservoir has a surface area of 12½ square miles. The dam which impounds these waters is 190 feet high and 2,432 feet long. It is located at the eastern end of the Andhra Valley, where it is narrowest. Water is drawn off at the western end of the lake, through a tunnel 1½ miles long. This tunnel conveys the water, under the mountain, at the foot of which the Bhivpuri Power Station is situated. This station went into operation in October 1922.

The Tata Power Company Limited

The third scheme, started in 1919, is the largest of the group. The natural catchments of the Nila and Mula Rivers, forming two arms each about 15 miles long, were dammed at the junction of their valleys; but, owing to the first large satyagraha movement in India started by the landowners in the valley, work on the dam was stopped for two years until acquisition could proceed smoothly. The Tata Power dam forms a lake with a surface area of 15 square miles. The water impounded in this lake is collected from a catchment area of almost 100 square miles. The dam is 146 feet high and 5,123 feet long. From the western end of the lake, a tunnel $2\frac{3}{4}$ miles in length was made under the mountains through which the water is supplied to the Bhira Power Station.

The Tata Power Hydro-Electric unit commenced supplying electric energy to Bombay in April 1927.

The Tata Hydro System

The three power stations are equipped with impulse water-wheels and the generators work at 5,000 and 11,000 volts. These generation voltages are stepped up to 100,000 volts for overhead transmission to Bombay and Poona. The supply from all three stations is so interconnected that no interruption to service is likely from a transmission line failure at any point on the system. The combined transmission system consists of 268 miles of overhead lines and 200 miles of high tension underground distribution cables in Bombay. The present aggregate installed turbine capacity of the three generating stations is 350,000 h.p. Electric energy generated by these hydro stations is supplied to the textile and other mills, the two railways, large industrial undertakings, as well as various distributing companies. These distributing companies include the Bombay Electric Supply and Tramways Company, the Bombay Suburban Electric Supply Limited, the Poona Electric Supply Co , Ltd., and five other smaller companies. Now forming an integral part of the 100,000-volt transmission system are the G. I. P. transmission lines running south-east to Poona and north-east to Igatpuri.

These lines are, at the present time, fed from the Tata Hydro high voltage system. What may be considered another important part of the interconnected system is the Chola Thermal Power Station with its installed generating capacity of approximately 55,000 h.p.

The railway electrifications out of Bombay, which are considered the most extensive in the British Empire, are supplied from the Tata Hydro system. The B B. & C. I. Railway is electrified from its terminal points in Bombay 35 miles north to Virar The G. I. P. Railway is electrified 85 miles on the main line north-east to Igatpuri and 119 miles south-west from the Bombay terminal.

The total capital investment of this great enterprise is in excess of Rs. 16 crores or about £12 million

Power Supply for the Bombay Mills

In 1911 (four years before hydro-electric service was made available in Bombay, when there were 83 mills operating in the area) 26 textile mills agreed to take hydro power. In 1916, one year after service was established, 29 mills made up the bulk of the Tata Hydro load. To-day there are 60 textile mills supplied from the Hydro system while ten now operate with power furnished by their own individual prime movers.

The Bombay mills now on hydro-electric supply are operating with a power service which in terms of continuity and dependability is highly satisfactory, and the cost of this service compares favourably with that of other leading industrial centres of the world.

There have been, in the short period of the past seven years, six reductions in the hydro tariffs for textile mills which have resulted in a decrease of approximately 40 per cent. In the average cost of power in this period. These reductions have been made possible by the expansion of business and improvements in the operating efficiency and finances of the Companies.

Conservation of India's Natural Resources

In the course of his speech on the occasion of laying the corner-stone at the first of the five Tata Hydro dams to be constructed, Sir Dorabji Tata referred to the smoke nuisance in Bombay and stated that the hydro electric energy to be consumed in the city would annually replace the combustion of 96,000 tons of coal. In contrast, it may be stated that during the year 1940 the Tata Hydro system production was approximately 778 million electrical units which, without water power, would have required the combustion of over 500,000tons of coal. In this respect, the existence of the Hydro Companies not only effected this appreciable conservation of India's natural resources, but has practically reduced to a minimum smoke, soot and dirt in Bombay, one of the world's most congested cities. The combustion of this coal would have also resulted in a deposit of approximately 4,000 tons of sulphuric acid, the destrucive properties of which the city has been spared.

As measured by the production and sale of electrical energy, the Tata Hydro system (under the management of the Tata Hydro-Electric Agencies Limited) is the largest public utility in India, Burma or Ceylon; its production is at the present time approximately 35 per cent of that of British India.

The Tata Hydro System will doubtless continue to contribute towards the industrial development and prosperity of Bombay and the other communities it serves by providing an economical supply of power to new industries and the additional energy requirements of existing industries as science develops new uses for electricity to improve operating efficiencies in the textile and other industries.

BANKS AND THE INDIAN COTTON INDUSTRY

By N. G. HUNT

First precarious foothold in India, what a vast benefit they were to confer on the peoples of this country. At the outset the banks were regarded with the gravest suspicion, the average citizen having no intention of depositing funds with them, preferring to bury his savings in the ground, or invest them in elaborate jewellery. It is, therefore, with the greatest patience and the strictest integrity that the bankers have built up that confidence and friendly relationship with the public which they now hold.

The average man little appreciates what a big part the banking system plays in the existence of a country. Regarding the bank as a place in which to keep his money and draw cheques for the convenience of paying accounts, he rarely knows that the bank is the source of the life-blood of industry.

Banking and Cotton

Ginning.—Before the advent of power-driven machinery, when hand-spinning and weaving was a local industry in close touch with the cotton grower, little finance was necessary. A man grew cotton on the land he had inherited from his father, it was then charkared by himself and his family, and sold or bartered to his immediate neighbours, who in their turn spun and wove it into cloth to suit their own needs.

As populations increased all over the world, more cotton goods were needed than could be produced in this fashion. Out of this necessity various inventions for power-driven machinery came into use, which could produce more cloth to meet the demand. In its turn this necessitated the growing of more cotton by the cultivator, thus enabling him to supply the needs of his ever-increasing family. Gradually power-driven ginning factories spread all over the country, giving extra work to the agriculturists in the season when their crops were gathered in.

These factories required financing on a basis quite beyond the ability of the local population. A few rich men got together and bought the necessary machinery and buildings, some of them were able to lock up the necessary funds to pay the cultivator cash and wait for their reimbursement until after the cotton had been ginned and sold, but as the trade gradually expanded, and as the trend of cotton was towards the ports, more extensive finance was needed. It was at this juncture that the banks came to the assistance of the Indian cotton industry, enabling it to expand in proportion to the ever-increasing demand and to hold its place against world-wide competition. Without this timely assistance Indian cotton, it is possible, would have been driven from international markets.

Loans were given by the banks on the buildings and the machinery, combined with the good faith of the proprietors of the ginning and pressing factories. These loans enabled the factories to pay cash for the *kapas*, wages to their workpeople, transport of the cotton and

the ordinary running expenses until such time as their cotton was paid for at the ports.

Spinning and Weaving.—The Civil War in America created a cotton famine in Europe. This stimulated the Indian cotton trade, and a large proportion of the crops accumulated at the ports of Broach, Bombay, and, to some extent, Calcutta, ready for export. Merchants conceived the idea of spinning, and to some extent also weaving, the raw cotton at these ports, where a constant supply of raw material was at hand all the year round, and where the humidity of the sea air gave the necessary climatic conditions for good spinning. Companies were formed and mills erected, well equipped with the latest machinery of the day. These mills cost a great deal of money.

It proved very difficult, however, to get the Indian investor to take shares in an industrial concern unless he could be shown high dividends. To overcome this difficulty mill companies were floated on a very low fully-paid-up capital basis compared with the actual cost of land, buildings and machinery. Frequently the capital called up from the public was not more than one-quarter of the cost of the mill to the promoters of the company, who had to finance themselves the balance of the payments. This custom led to the agency system of mill management. The agency system has been much called into question in recent years, but there can be no doubt that without it the industrial equipment of India could never have hoped to attain its present fine development.

Owing to heavy commitments by the agents it can be appreciated that ready money had to be found for running expenses, which, without the assistance of the banks, would have been impossible. In the best conditions of the market the time-lag between payment for raw materials and wages and the receipt of money for the manufactured goods is considerable. When conditions are less good and markets sluggish the interval during which money is locked up is very much longer. Without the help of the banks no mill could afford to pile up stocks indefinitely and the company would be faced with the expensive necessity of closing the mill until the market improved.

How costly such a closing down may be is little appreciated. The overhead expenses of management, insurance, municipal and property taxes, etc., continue. Machinery has to be tended. Labour is dispersed and difficult to get back. Therefore, rather than face this non-productive expenditure, it is preferable for the mill to continue working for stock and run at a loss in the hope of better times to come. This again requires heavy finance, only procurable through the banks.

Methods of Finance

Bank managers and directors in the interests of their own shareholders are compelled to lend with circumspection. They have formulated various methods in an effort to give the maximum assistance to the (Continued on p. 233)

INDICATORS OF BUSINESS ACTIVITY IN INDIA

В۷

J. V. JOSHI, M.A. (Cantab)

Director-General of Commercial Intelligence and Statistics

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m N}$ 1933, the Government of India started the ${\it Monthly}$ Survey of Business Conditions. It was an attempt to collect and present in a handy form all the statistical data available with Government which could throw light on the business conditions in the country from month to month. Statistics regarding industrial production, wholesale prices, foreign trade and financial activities were given in great detail and explanatory notes and comments were also included. The Survey, however, did not attempt to measure the trends of many of the series in the form of specially constructed Index Numbers, the only exception being the Securities Index Number which indicated the fluctuations in the prices of securities and shares in the share markets in India. Indices of wholesale prices and of the cost of living in various centres which were already available, were also included in the Survey, but such indices as those of industrial production, whether for individual industries or for all industries, or any index dealing with general business activity, were not attempted As regards the Index Number of industrial production, the absence of the Census of Production in India made it difficult for Government to compile such an index. Moreover, as statistics of industrial production were collected on a voluntary basis, the data were far from complete even in the case of those industries which co-operated, while in the case of many other industries, production statistics are not forthcoming at all. With the passing of the proposed Statistical Act, this difficulty may be overcome, and the question of compiling an index of industrial production will no doubt be examined by Government when times are more propitious. The problem of constructing an index of general business activity in the country is still more difficult for the Government of India to undertake. Even in the United Kingdom and the United States of America, the Government does not attempt to construct and publish such an ındex. It is only proper that the Government of the country should not express any definite opinion on the exact trend of business activity at any particular time as its economic and financial policy is intimately bound up with its judgment on this point. It is naturally, therefore, left to private agencies, like financial newspapers or special organizations to perform this work. In England one of the leading financial journals, The Economist, publishes its own index of business activity. The work is done as efficiently as one would expect from a journal of the standing and reputation of The Economist, but even then it does not escape some adverse criticism. A similar index for the United States of America is published by the New York Times and more fully by the Analyst, and one private agency which supplies statistical information also prepares such an index

The Position in India

It will thus be seen that it is left to private enterprise to construct such an Index Number even in statistically advanced countries like the United Kingdom and the United States of America. The Government of

India cannot naturally, therefore, undertake such a task, especially as its ability to collect detailed statistics is severely curtailed by the limited financial resources available for this purpose The gaps in our statistical information about business activity in India make it hazardous for even a private agency to attempt to construct such an index. One of the important items for which little or no statistical data are available in India, is that pertaining to employment. Statistics of persons employed serve as a very good index of business activity in other countries. In India, except for the information that can be gathered, only annually, from the Factory Inspectors' reports, there are no statistics of employment and the available data collected under the Factories Act are defective in many ways and, being available only yearly, are of little value as an indicator of business activity, especially as it becomes available considerably after the close of the year to which it relates. Another indicator of business activity in other countries is the Industrial Profits Index. The Economist publishes such an index for the United Kingdom, and similar indices mostly compiled by private agencies are available in many countries. In India it is not impossible to construct such an index, and a rough attempt has been made in the Review of the Trade of India in recent years to work out such an index with the available data. But here again, the statistics have perforce to be collected after the close of the year and are generally considerably delayed and therefore lose their value as an indicator. A good indication of business activity is also obtained from the volume of stocks of industrial commodities. But these figures, which are difficult to obtain in any country, are almost impossible to collect in India except in the case of one or two industries where even they are only partially available. In view of these practical difficulties, it will be very difficult for any agency to undertake the construction of an index of general business activity in India, as information on some of the important component statistical series is wanting. But a courageous attempt has been made by one of India's leading financial journals, viz., Capital. In March, 1938, Capital published its index of business activity in India. The issue of Capital of 17th March, 1938, describes fully the construction of the index and the method followed. The index comprises six constituent series, viz, (i) industrial production, (ii) mineral production, (iii) index of internal trade, (iv) financial statistics, (v) indices of the value of exports and imports and (vi) indices of shipping activity. The base has been taken as 1935 and the series have been corrected for normal seasonal fluctuations. The system of weighting the various series has been based on considerations of gross output value as estimated from the Reports of production and prices, the volume of production, the size of the industry (as indicated by the capital invested in it), the value and volume of goods handled and the value and volume of transactions. The weighted geometric mean of the component series has been taken to form the general index Without entering into any

elaborate discussion about the weights and the completeness of the series included, it may be admitted that this is a valiant attempt on the part of Capital to construct an index of business activity in India. But Capital itself would not surely claim that the index is without theoretical and practical defects, and it is an open question whether the available data in India are adequate to enable the construction of such an index. There is no doubt, as Capital claims, that the index is useful and interesting, but as they themselves admit, it is still in an experimental stage. The difficulty in India is to get any verification of the index as compiled, since we have no statistical series which will enable us to examine how far the index itself reflects truly the fluctuations in business activity in India. A great deal of spade-work will have to be done and many statistical series will have to be started before it will be possible to compile a fairly accurate index of business activity in India. Without in any way detracting from the value of the index compiled by Capital, one may be allowed to hold the view that the index of business activity like the one published by The Economist is still not a practical proposition in India at present. This is not to suggest that, though a composite index may not be feasible, it is not practicable and useful to construct other types of indices which would throw a great deal of light on the fluctuations in business activity in India. The last two or three numbers of the Review of the Trade of India indicate what can be done on these lines and a brief reference to the statistical series graphically represented in the Review of Trade would not be out of place.

Review of the Trade of India

The Review of Trade has given the statistical series under four main heads. The most important section deals with industrial conditions and gives first, general statistics for all industries and then for the individual industries. This is followed by a discussion of prices in India, of financial conditions and of trading conditions. Except in the case of industrial profits and prices of securities and shares, no attempt has been made to combine any of the series for the industries as a whole. The Industrial Profits Index is frankly not a general profits index, but is merely an unweighted index of gross profits earned by some important companies in India. The Securities Index, on the other hand, has been planned on a more elaborate and scientific basis which was fully explained in the Monthly Survey of April, 1937. Industrial production and industrial prices are given separately for each of the important industries. The general series about industries are followed by detailed series about individual industries. In most cases, profits of the important companies in the industry are first given on a chain index method and this is followed by a chart which depicts the monthly variations in production, prices of securities of some of the important companies and prices of the main products of the industry. In a few cases, available stock figures are also given. This information is presented in the case of six or seven of India's leading industries. The second main section discusses the price changes during the year. The financial section gives the short and long term interest rates and deals with exchange fluctuations and conditions in the stock and money markets. The trading section shows the changes in the foreign and internal trade and gives the quantum of trade. It will thus be seen that the Review gives almost all the available series which indicate the fluctuations in business activity during the year under review. The statistics, however, are

published after the close of the year and cannot serve as indicators of business activity. Some of these statistics are available only annually, but many of the series are available monthly and these are given in the Monthly Survey. For reasons explained above, the Government of India cannot undertake to collect further statistical series for the present. But a more fruitful line of progress would be for each industry to collect and compile its own series. The various Central Banks do this for financial activities and there is no reason why highly organized industries should not do so for the particular field they cover. How this can be done may be shown by some practical suggestions regarding one of the most important industries in India, the cotton mill industry, with which the Indian Textile Journal is intimately connected. Such a journal with its numerous and close contacts with the cotton mill industry could undertake this work. How this can be done will be briefly discussed in the following paragraph.

It is neither feasible nor desirable to attempt to work out a single composite Index Number to indicate the fluctuations in the cotton mill industry. The most practical proposal would be to construct a number of statistical series with their index numbers dealing with the various available indicators. Some of the series can be monthly while others must be for longer periods. The series which could be worked out for the cotton mill industry are briefly indicated below. The list is probably not exhaustive and can be improved on experience.

Production

In constructing a statistical series indicating the changes in production in the cotton mill industry, one might work on the basis of (i) consumption of raw cotton by mills, (ii) yarn production, and (iii) production of piecegoods. Monthly production figures of both cotton yarn and piecegoods are published by the Department of Commercial Intelligence and Statistics in a separate Blue Book and provisional figures are published earlier in the *Monthly Survey*. Figures of consumption of raw cotton by mills are published by the Indian Central Cotton Committee. From a practical point of view, it will be advisable to take figures of production of cotton piecegoods as they are available earlier from the *Monthly Survey*.

Prices

There is no satisfactory index number of prices of cotton manufactures in India. The Calcutta Index Number published by the Department of Commercial Intelligence and Statistics which is being published in the Monthly Survey is not quite satisfactory for this purpose, as a preponderating importance is given in that index to imported varieties. The Index Number compiled by the Bombay Labour Office is also out of date. The Bombay Textile Labour Inquiry Committee felt keenly the absence of a satisfactory index of prices of cotton manufactures for their investigation and they had no option but to construct an ad hoc and special index number for their inquiry. (Vide the Interim Report of the Committee.) It is most disheartening that there should be no good index number of prices for such an important industry. It is certainly not beyond the resources of the industry itself to construct such an index. The Bombay Millowners' Association collect detailed prices for many of the varieties of piecegoods produced by their member mills and similar statistics would be easily available from the Ahmedabad mills. A wide selection of representative varieties of yarn and piecegoods could be made from these price lists and an index

THE NEW TRADE MARKS ACT

By

K. RAMA PAI, M.A.

Controller of Patents and Designs and Registrar of Trade Marks in British India

Jubilee celebration of the "Indian Textile Journal," is also an epoch-making year in the history of the Indian Patent Office, as well as in the history of Trade Marks legislation of this country. It is the year that has provided the first legislation for the registration of trade marks in British India, namely, the Trade Marks Act, 1940 A brief history of this legislation was given by the Hon'ble Dewan Bahadur Sir A. Ramaswami Mudaliar, who was the sponsor of the said enactment in the Central Legislature, and may be summarised as follows:—

In the year 1875, an Act for the registration of trade marks was passed in the United Kingdom. Two years later, the Bombay Millowners' Association—" that very vigilant commercial body "-applied to the Government for legislation on the lines of the measure passed in the United Kingdom, and in 1879 the Government of India introduced a Bill in the then Imperial Legislative Council for the protection of trade marks by way of registration. The Bill was circulated to various commercial bodies and when the Select Committee considered the Bill, it was found that the opinions were so hostile to the measure as introduced that the piece of legislation had to be dropped. Several successive efforts were made by the Government of India in the same direction, but commercial opinion was either not unanimous or predominantly hostile to the provisions of such a Bill. The turning point in the history of the legislation on this subject came about in the year 1927, when the Indian Industrial and Commercial Congress passed a resolution recommending to the Government of India the introduction at an early date of legislation for the registration of trade marks in India, pointing out that in the absence of such legislation Indian merchants are put to considerable hardship both in India and abroad. The inconveniences experienced by the commercial community on account of the absence of such a legislation became so pronounced in recent years, that several chambers of commerce, and also prominent legislators as well as the Press, made similar requests to the Government, and it was soon evident that public opinion was predominantly in favour of an urgent legislation for the registration of trade marks in British India. But having regard to the previous history and infructuous attempts that had been made repeatedly by the Government of the day, the Government of India felt that they should proceed on the most cautious basis possible, and ascertained again the opinion of the commercial bodies and Provincial Governments by circularizing a memorandum in which the history of the piece of attempted legislation was laid down. The opinions put forward on the memorandum were almost unanimously in favour of the immediate enactment of suitable legislation, and formed the basis of the Bill which finally resulted in the Trade Marks Act, 1940.

The Trade Marks Act, 1940, therefore, marks the culmination of an effort on the part of the Government

undertaken more than 60 years ago. The Act received the assent of the Governor-General on the 11th March 1940. The progress made since then for implementing the provisions of this Act has been quite rapid. A Trade Marks Registry has been established at the Patent Office, Calcutta, and a Branch of this Registry has been established at Bombay.

Difficulties of the Commercial Communities

For an appreciation of the changes brought about by the new legislation, it is necessary to refer briefly to certain difficulties experienced by the commercial community, owing to the absence of a measure of this nature. In this connection, it is to be noted that although there was so far no Trade Marks Act in British India, owners of trade marks were not wholly without a measure of protection for their marks. This protection was available partly under the penal provisions contained in the Merchandise Marks Act, and partly under the civil law of the country. But, as pointed out by the Hon'ble Member responsible for the new enactment, the protection available before the passing of the Act was neither real nor effective. As remarked by Lord Justice Moulton.

"Penalties are utterly inefficient for the purpose of preventing bad practices. It is infinitely better to be able to call in the assistance of a civil court and get an injunction preventing a bad practice being continued. There are many people who would willingly pay a penalty for something nefarious once a fortnight; they would probably earn it in an hour or two next day. It is very much better to have the power of getting an injunction which nobody dare disobey."

An "injunction" for preventing an unauthorized use of a trade mark may be obtained only by instituting what are known as "passing-off" actions. "Passingoff" actions are based on the principle that no man has a right to sell his goods as the goods of another. Traders usually adopt a particular trade mark or get-up for their goods in order to distinguish their goods from similar goods of other traders, and no trader is justified in taking the peculiar symbol, device or mark or any accompaniment by which another man distinguishes his goods in the market, and so attract to himself the custom which would otherwise flow to his rival. It is accordingly necessary for a plaintiff in each "passing-off" case to prove firstly that the trade mark or get-up which is alleged to have been infringed has become distinctive of his goods in the eyes of the purchasing public. This part of a "passing-off" action is extremely troublesome and expensive to the plaintiff, as a large volume of evidence is necessary to establish his exclusive right to the use of the trade mark in question. But the worst feature of the "passing-off" actions is that success against one infringer does not confer immunity from the obligation to prove the plaintiff's title afresh in each case, even if the subsequent action happens to be before a court in which he had already established his title. It is not as if once a plaintiff establishes his right in any particular court, as against one infringer, that right would be recognized against the whole world. With reference to each individual who invades his right, and with reference to every area where it is invaded, he must necessarily have his right established afresh by a court of law. In other words, every time he seeks the protection of the court, he has to incur the expense and trouble of adducing evidence of his title to the trade mark adopted by him. An important object of the new Act is to remedy these drawbacks and to provide a simple and less expensive means by which the proprietor of a trade mark may prove his title to the mark in any court of law. The provisions of the Act which are intended to achieve these objects are as follows:—

Main Provisions

"In all legal proceedings relating to a registered trade mark, the fact that a person is registered as proprietor thereof shall be *prima facie* evidence of the validity of the original registration of the trade mark and of all subsequent assignments and transmissions thereof." (Section 23)

"In all legal proceedings relating to a registered trade mark, the original registration of the trade mark shall, after the expiration of seven years from the date of such original registration, be taken to be valid in all respects unless such registration was obtained by fraud, or unless the trade mark offends against the provisions of section 8." (Section 24)

"A certificate purporting to be under the hand of the Registrar as to any entry, matter or thing that he is authorized by this Act or the rules to make or do shall be *prima facie* evidence of the entry having been made, and of the contents thereof, or of the matter or thing having been done or not done" (Section 75(2).)

By virtue of these provisions, all that the proprietor of a trade mark will have to do for proving his title to the mark in any court of law, will be

- (1) to get himself registered as the proprietor of the trade mark, and
- (11) to obtain a certificate from the Registrar that he is the registered proprietor of the mark.

So long as the registration is in force, a *prima facie* evidence of the proprietor's title to the mark can be obtained by the simple and inexpensive expedient of obtaining a certificate from the Registrar, and the proof will be conclusive if registration of the trade mark has been in force for more than seven years.

Another convenience available to the owner of a registered trade mark is concerned with the extent to which the defendant's guilt should be established by him before succeeding in an action against the infringer. It is an essential condition of "passing-off" actions that the plaintiff should establish that the alleged use of the imitating trade mark or get-up by the defendant is likely to "pass off" the latter's goods as the goods of the plaintiff. Very often this is not an easy matter. Under the new Act, this difficulty is obviated by virtue of section 20, which, while providing that the new Act will not affect the rights of instituting "passing-off" action against any person for "passing off" his goods as the goods of another person, gives also a right of action, by means of an "infringement" suit, to stop the unauthorized use of a registered trade mark, irrespective of any question as to whether such a use would be likely to enable the defendant to "pass off" his goods as the plaintiff's goods.

In this connection, it is important to note that while the right of instituting "infringement" suits (as distinct

from "passing-off" actions), would be ordinarily confined to the infringement of registered trade marks, an important exception is provided by which proprietors of trade marks which have been continuously in use since before the 25th February 1937, will enjoy the right of instituting "infringement" suits even in respect of trade marks which fail to secure registration, if within the first five years of the commencement of the Act, they make their applications for the registration of such trade marks. It would, therefore, be distinctly advantageous for the owners of such marks to come forward with their applications for registration before the expiry of five years from the commencement of the Act.

Another point which deserves mention here is that as there was no law for the registration of trade marks in British India prior to the enactment of the Trade Marks Act, 1940, owners of trade marks used to take recourse to the expedient provided for by certain chambers of commerce for registering the marks in the registers maintained by such chambers, and also to the practice of registering "declarations of ownership of the marks" under the Indian Registration Act, XVI of 1908 As these private or quasi-official registrations have been in extensive use, it is necessary to point out that persons who have availed themselves of such registrations cannot obtain the protection available under the Trade Marks Act, 1940, unless their trade marks are registered afresh in accordance with the provisions of the latter Act

Having explained the main purposes of the new enactment, I shall refer to some of its other provisions. The most important of these is perhaps that contained in section 4 which provides for the establishment of a Trade Marks Registry at the Patent Office where a central record called the Register of Trade Marks, should be kept. The absence of an official register of trade marks has been a serious handicap to honest traders desirous of placing their goods upon the market under a new trade mark, and in a number of cases, has also been the basic cause of innocent infringements of trade mark rights. The proposed register would provide traders with a record with the help of which they can avoid adopting as their trade mark any mark which would bring them into conflict with owners of other established marks entered in the Register.

Since, as pointed out above, the registration of a trade mark would make it easy for its proprietor to institute legal proceedings on the alleged infringement of his trade mark, care has been taken to ensure that registration is effected only after a careful scrutiny as to the registrability of the mark, and as to the *prima facie* title of the proprietor to claim exclusive use of it in connection with the goods in respect of which it is to be registered. The Act, therefore, provides both for a departmental examination by the Registrar, and for opposition by anyone interested, of every application made for the registration of a trade mark.

A provision of the Act which would be of immense use to traders desirous of choosing new marks for their goods, is that contained in section 6, which lays down that in order to be registrable, a trade mark should comprise or consist of one or more of the essential particulars specified therein. Vast sums of money are nowadays spent by the commercial community for popularizing their trade marks by advertisement, but turns out not infrequently that the marks adopted by them for this purpose are inherently incapable of being

(Continued on p. 209)

THE MANAGING AGENCY SYSTEM: CAN IT SURVIVE?

Bv

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TORE than 80 years have elapsed since the first cotton mill in India inaugurated the system of management of an industrial concern by managing agents, and in this period the managing agency system has taken deep root with results of mixed kind. Few amongst its bitterest critics would deny that but for it industrial advance would not have been even as rapid as it has been; the Indian cotton industry in Bombay and Ahmedabad and in other centres owed its development to the managing agents who promoted, financed and managed the mills. But there are many to-day who sincerely feel that the adoption by Indians of a system which served the purposes of the Britisher and British capital has done the country more harm than good, and that industrial development in India would have been more rapid and more broad-based but for the vicious managing agency system. It is necessary to examine this issue as objectively as possible.

How It Originated

The managing agency system of industrial management in India is said to be unique and without parallel in the rest of the world. Put in that sweeping form, the statement is not correct; for there is a fairly close resemblance between the British managing agency system in India and the systems of management found in China, Japan, S. Africa, etc., where in similar circumstances the exploitation of a country's resources has been kept as a close preserve by the foreign capitalists without having to share it with the natives of the country. The managing agency system was an indispensable and convenient device to establish foreign economic rule in less advanced countries and to maintain it even when, on account of changes in the ownership of capital, the natives of the country come to acquire a certain portion of the shares of the industrial company. The adoption of the ordinary Board form of management would have inevitably led to the sharing of the rights and advantages of management with the natives of the soil and ultimately to surrendering them. It is also true as a pure historical fact that the number of Indians available for sharing control with the Britishers was extremely limited during the formative period of the British managing agency system.

A Defective System

What, however, is unique and peculiar about the managing agency system is its universal adoption by Indians also in the flotation and management of all kinds of industries. But there was not equal justification and logical necessity for Indian capitalists and financiers to adopt a similar system which can only be explained partly by their imitation of the British and partly by the opportunities for private gain opened up under that system. It is true that to some extent the lack of a wide investing class led to the imposition of the burden of financing industrial concerns on the originators of the scheme, who therefore wanted to assure themselves of a long and continuous period of management. But

there was nothing to prevent them from starting as either private unlimited concerns or as partnerships or private limited companies. Such additional funds as they needed might well have been obtained from the public in the form of deposits or in other ways. Instead, what was done was to float public limited companies the shares of which were partly taken by the public, who, however, had absolutely no voice in the management of the concern either directly or indirectly. Directors were not representatives of the shareholders; they were merely nominees of the managing agents. For the uncertain chance of getting a dividend the shareholders had to forgo the right of exercising any kind of control over the management through their accredited representatives.

The system was therefore inherently defective. But it might have worked better if two conditions had been fulfilled. If the men who worked the system were inspired by broad considerations of public good, as indeed were some industrial leaders, the defects would have been counteracted. Or, if the industrial leaders were such as would take full advantage of the opportunities of co-ordination, cheap purchase, efficient sales and unified administration which the system afforded to the uncontrolled managing agents, the costs would be less than under the traditional Board system of management, and the shareholders would have had the satisfaction of larger dividends at the expense of freedom to elect their own management each time. Neither of the two conditions was satisfied. On the other hand, the theoretical possibilities of economy were either not properly explored or, more often, were utilized only to further the personal interests of the managing agents at the expense of the shareholders. As long as the former owned a large percentage of the shares of the companies under their management, they had at least some interest in maintaining dividends But when their holdings became inconsiderable, the divergence of interest between the shareholders and themselves became pronounced.

Even at its best the system was looked upon with distrust and suspicion because the very reasons that led to its adoption such as the experience of the managing agents, their large trading activities and their financial ability, rendered them independent of any outside check and, human nature being what it is, it was not surprising that several of the managing agents misused their powers. The managing agency firms, whether they be family concerns or partnerships or private limited companies, were all engaged in various trading, commercial, financial, insurance and other activities, and industrial management constituted only one side of their activities. The management of a cotton mill or other industrial unit was prized not only for its own sake but for the opportunities it gave to enable them to realize vast gains from many other sources. On the purchase of raw materials and stores and machinery, on insurance of buildings, equipment and materials, on the sale of goods and as shipping agents for the industrial company they were in a position to earn large commissions. Thus as long as an industrial company was actually at work the managing agent was able to make large gains, although the company itself might be working at a loss

It Creates Economic Oligarchy

The result of the working of the managing agency system was that it created a sort of economic oligarchy in which power was concentrated among a few individuals who constituted themselves as managing agents. With a few notable exceptions, these were guite content to follow the trail blazed out for them by pioneers, and more and more cotton mills were established on similar lines of organization and management. Where the opportunities for easy and quick gains were so vast, it was not surprising that they showed no initiative nor sought new and untrodden paths, and thus we find that after nearly a century of the establishment of the cotton industry, it continued to depend upon foreign imports for its ancıllaries and accessories. The industry cannot boast of the patenting of one new machine or loom or any other apparatus of note as the more recently developed Japanese industry could. The present war found it in the same state of dependence on imports for its chemicals, stores and other materials. The advantages of localization so pointedly referred to by Professor Marshall in his Principles of Economics, that it creates ancillary and subsidiary trades which can cater to the needs of the main industry, have had no application at all to India. On the whole, the managing agency system cannot plume itself on its fine feathers, for its defects are now so much more patent than its merits

Its Services to Bombay

And yet it would be wrong to neglect or ignore all that it has done for the country. The cotton industry of Bombay and Ahmedabad would not have developed as fast as it did but for the entrepreneur spirit of the managing agents. The great development in the Iron and steel industry by an Indian firm of managing agents will alone suffice to save the system from absolute condemnation or discredit. Further, the system could not have flourished as long as it has done but for the essential role it had to play in the history of economic development of our country. The conditions under which the managing agency system was brought into existence are so well known as hardly to need emphasis. Capital available for investment in industry was extremely limited and was in the hands of a few wealthy merchants who were already engaged in trade and commerce. There was a scarcity of industrial leadership outside this limited class and hence the whole task of pioneering, promoting, financing and managing the mills fell on these merchants who naturally desired and were able to get control of the industries which they floated. Considering the variety of services which they rendered to industry they were certainly entitled to large remuneration. For the service of promotion and pioneering, for the initial outlay which they risked in enterprise and for their financial help, they deserved payment in addition to that for their service of management.

In the early stages of our economic development the banking organization had not been built up, and even when joint-stock banks came to be established they were, of course, not equipped for advancing permanent and long-term capital to industry, and even

as regards the working capital required by industry, the conditions under which it was granted were such that the guarantee of the managing agents became indispensable. Industrial finance had thus entirely to be provided either directly by the agents or indirectly through their influence with the public or by their quaranteeing the banks It is true that as the capital market and banking developed in the country their role as financiers of industry might easily have been reduced, and industrial companies could have financed themselves by going directly to the capital market and to joint-stock banks for long-term and short-term capital, respectively. But until recently that was not possible Indeed the Ahmedabad mill industry could never have reached the size and importance which it has under any other system. Further, in the absence of an organization to investigate new propositions and to underwrite the capital until the shares were ready to be issued to the investors in the capital market, the managing agency system filled a very useful gap—a gap which to this day remains as wide as ever. Again, in times of depression their financial service becomes very important as banks are unwilling to advance credit in times of falling prices, and but for the managing agents many more mills would have become bankrupt than was actually the case.

Indian Managing Agency a Failure?

But their main function was to manage the industrial companies in their charge efficiently and successfully. Were they properly equipped for this task? Was their management economical? It is here that the Indian managing agency system presents itself in unfavourable light as compared with the British managing agency system, and this for several reasons. In the first place, Indian firms with a few important exceptions are not genuine long-standing institutions with long experience of business and commerce They are often either individual concerns or loose ad hoc bodies created temporarily for the management of particular industrial units and the supposed economies resulting from the division of functions among the members of a managing agency firm are conspicuous by their absence. The want of technical knowledge on the part of the managing agents has continued to be a defect not yet remedied. There has been no attempt to get as partners men who will supply the deficiency in technical, managerial and other experience. The Indian agency firms have been mostly hereditary, and as talents are not always inherited, the firms fall into the hands of inefficient men, Since the shareholders are unable to get rid of incompetent management under the managing agency system. it constitutes a serious weakness. From this point of view the system of Board management is certainly superior, and it is a great thing that under the new Companies Act the shareholders will have the right to test and assess the work of the managing agents every 20 years at least. British managing agency firms, on the other hand, are able to absorb continuously a fresh stream of talents from among the senior assistants and managers of industrial companies who are allowed to

From the point of view of internal organization, too, Indian managing agency firms are found to be seriously defective. There is no proper division of functions, as in the majority of British firms where each partner is in charge of a definite number of departments Further, there is a definite system of recruitment of technical and other staff required for the management of enterprises controlled by British agency firms, and while the salaries

(Continued on p. 211)

TRADE UNIONISM IN INDIA

В۷

B. SHIVA RAO, M.A.

ANY profound changes have taken place in India since the end of the last war, but few of such lasting significance to her social structure as the organization of the industrial workers into a definite movement

Before the war, though strikes were not unknown, class consciousness was hardly developed among the workers, and public opinion was, on the whole, apathetic towards the problems of industrial labour. Evidence of a ghastly character, tendered before the Factories Commission in the first decade of the present centuryof ginning factories working sometimes as many as 17 to 18 hours a day and of perennial factories working on the generally accepted principle of sunrise to sunset, which meant in the summer 13 to 14 hours inside the factories—evoked remarkably little sympathy and response from the general public. Indian industry was so absorbed in its task of consolidation against outside competition (particularly from Lancashire) that it was almost callous in its neglect of the claims of the human factor

In fact, one of Mr. Montagu's first references to India, as Under-Secretary of State, was an eloquent appeal in 1910 to the leaders of Indian opinion to "set their faces against the degradation of Indian labour," and his exhortation to them "to be specially vigilant, because India's working classes, besides being themselves unorganized, were not represented on the Legislative Councils whose Indian members came almost exclusively from the landlord and capitalistic classes."

Popular Apathy

Even during the last war, despite rapidly rising prices, there was in the earlier stages little evidence of any general movement towards organization. The Indian Industrial Commission, in dealing with the causes of the alleged inefficiency of labour, had pointed out with shrewd insight:

"If the children of workers are provided with education under tolerable conditions of life, a new generation of workers will grow up who will learn to regard mill work as their fixed occupation. Better housing is a most urgent necessity, especially in the large congested industrial cities. Facilities for health, amusement, shorter hours of work (though reduction may for a time decrease output), and other measures for economic betterment, such as cheap shops for the sale of articles required by the millhands and co-operative societies, are almost equally important. The problem, not only on moral grounds, but also for economic reasons, must be solved with the least avoidable delay, if the existing and future industries of India are to hold their own against the ever-growing competition which will be fiercer after the war. No industrial edifice can be permanent which is built on such unsound foundations as those afforded by Indian labour under its present conditions."

But it was not until April 1918 that almost an accident led Mr. B. P. Wadia (then Assistant Editor of Dr. Annie Besant's paper *New India*) to take the initiative in organizing the textile workers in Madras. How clear Mr. Wadia's vision was in taking this step is obvious from a striking observation in one of his earliest speeches:

"Without the masses, there can be no true democracy . . . We want to bring the masses into line with the educated classes . It is very necessary to recognize the labour movement as an integral part of the national movement. The latter will not succeed in the right direction of democracy if the Indian working classes are not enabled to organize their forces and come into their own. Unless this is done for all classes of labourers—peasants, plantation workers, factory hands and miners—even the Montagu Reforms will only succeed in transferring the power of the bureaucracy from foreign to native hands; that is not democracy."

It is somewhat difficult, after the lapse of almost a quarter of a century, to realize how deeply the imagination of the country had been stirred by the wai and the new technique of mass appeal inaugurated by the political leaders of the last generation. This factor, coupled with the unprecedented rise in prices and the grave shortage of labour in certain areas in consequence of the influenza epidemic which swept over India immediately after the cessation of hostilities, gave an enormous fillip to the workers' movement. All over India, but particularly in the big industrial cities and on the railways, unions sprang up, some no more than ad hoc strike committees, but others destined to survive the immediate circumstances of their origin.

From the standpoint of the employers, two considerations seemed to have governed their attitude towards the new movement. In the first place, the phenomenal prosperity which the war had brought to Indian industry in general was a check against the enforcement of policies which might lead to dislocation of work. Secondly, they needed time to get a correct measure of the real strength and direction of the movement. There were, of course, exceptions, a notable one being in Madras where a leading employer took legal action against Mr. Wadia and his associates for their trade union activities.

The Movement Spreads

But, on the whole, the spread of the movement was extraordinary in the absence of formidable opposition from the employers. Within a few years, not only had come into existence in several leading unions industries in Madras, Bombay, Bengal and the U.P., but labour federations were established for the discussion of problems of common concern. Two other factors helped the movement at this stage. The International Labour Conference at Geneva stimulated, by its procedure of inviting representatives of the largest workers' organizations from Member-States, the development of the All-India Trade Union Congress. Secondly, under the Montagu scheme of reforms, labour accorded representation through nominated members in the Central Legislative Assembly and some of the Provincial Councils.

Besides the Trade Union Congress, with its provincial organizations and affiliated unions, there was started, a few years later, the All-India Railwaymen's Federation vested with general control over practically all the railway unions in the country. Efforts have been made from time to time to establish a textile federation on a similar basis, but so far without success. The seamen, on account of the nature of their occupation involving long absence from home ports and the acute unemployment prevalent in their ranks, have also been unable to advance beyond the stage of local unions in Bombay and Calcutta. In certain types of industry like sugar, in the tea plantations of Assam and the collieries of Bihar and Bengal, inherent difficulties have prevented large-scale organization.

It was perhaps inevitable that the origins of the movement should be found in an epidemic of strikes

and lockouts all over India 1921 is still the record year for industrial disputes, 396 in number, though the total loss in working days was only about 7 million. The earlier strikes were of comparatively short duration, mainly because of the employers' unwillingness to face any serious dislocation of industry. But gradually, as wartime prosperity began to fade, and strikes became less successful, the weapon lost much of its earlier attractiveness for the worker; and by 1927, the number had dropped to 129 disputes with a loss of 2 million working days.

Militant Elements

At this stage, however, there emerged from within the ranks of the young movement, certain militant elements professing allegiance to Moscow's revolutionary creed and an unconcealed contempt for the "reformist" programme of many of its leaders. Several employers, unconsciously perhaps, assisted in strengthening the hold of these elements on certain unions by yielding to threats what they would not concede as a result of negotiation and reasoned argument. Nothing stands out in bolder outline, in the post-war development of trade unions in India, than this curious attitude of the employers. In some instances, they even deliberately helped the extremist sections, presumably in the hope that the moderate elements would thereby be discredited and the influence of the unions undermined. Whatever the reasons, 1928 and 1929 will remain peak years for the terrible trials which industry, particularly in Bombay, had to endure. In these two years alone, there were 350 strikes and lockouts, resulting in a total loss of nearly 44 million working days.

The last decade has brought, on the whole, a period of comparative quiet for industry. The report of the Royal Commission on Labour in 1931 seemed to inaugurate a period of many-sided reform. And so far as the workers were concerned, the split in the ranks of the All-India Trade Union Congress in 1929, over differences in regard to fundamental principles which seemed irreconcilable, had a demoralizing effect on all the affiliated unions. Moreover, the strikes and lockouts of 1928 and 1929 had brought disillusionment and despair in their wake, a contributory factor was the prolonged "Meerut Conspiracy" trial which deprived them for four years of their left-wing leadership To add to these difficulties, there was the severe economic depression which shook industry to its foundations.

The number of disputes, therefore, until 1937 seldom rose to beyond 150 in a year, and the loss in working days remained fairly steady in the neighbourhood of 2 million per year. Since that year, however, industrial unrest has shown a marked upward tendency, the number of strikes in 1937 being 379, involving a loss of 10 million working days.

The greater freedom exercised by the workers since the inauguration of provincial autonomy and the large-scale reforms to which political parties like the Congress are pledged have had, undoubtedly, an unsettling effect on the minds of the workers. To those who are interested in that aspect of the problem, a study of the methods employed by popular Governments in dealing with industrial disputes would be instructive in throwing into sharp contrast the mentality of their predecessors in similar situations: far greater and prompter use has been made since 1937 of the provisions of the Trades Disputes Act for the settlement of disputes by negotiations and through inquiry or arbitration.

Membership and Finance

It is a question over which employers and Governments might alike ponder whether industrial progress could not have been quickened by a more humane attitude towards labour In these 20 years, the total number of disputes is about 3,500, with a total loss in working days of over 120 million. One cannot deny that, in the earlier phases of the movement, strikes were occasionally brought about by leaders for political or even personal reasons. But in general it would be a gross exaggeration to suggest that the ignorance of the worker has frequently been exploited by "interested fomentors of agitation." His ignorance does, indeed, impede the growth of the movement; but there is a surprisingly large fund of practical sense in the Indian working class of which the outsider can have little knowledge. As a matter of fact, trade unions in this country have shown, since their early beginnings, a remarkable preference for inquiries into their complaints by impartial bodies and, generally, for constitutional methods for the removal of their grievances. Had the Provincial Governments and the employers only responded in the same spirit, the history of industry in India would have been very different.

Judging by numbers alone, the growth of trade unions in India may not strike one as impressive. The All-India Trade Union Congress and the Ahmedabad Labour Association (which has always preferred to stand aloof from the Congress) between them cannot claim a total membership of more than 400,000. There may be a few scattered unions in the country, of comparatively little importance and unaffiliated to any larger association. But making the most generous allowance for such unions, it is doubtful if the combined strength of all the organizations would exceed half a million. This is a mere fraction of the total number of at least 30 million industrial workers in the country.

The official figures of the Registrars of Trade Unions seem to support this estimate of total membership. In 1938, of 420 unions, 343 had submitted returns, showing an aggregate membership of over 390,000. The total annual income of these registered unions was nearly Rs 7 lakhs, with an average of just over Rs 2,000 per union and Rs 1-12 per member. To appreciate the rate of progress of the movement, it is necessary to compare these figures with those for previous years. In 1927-28, the first year after the passage of the Trades Unions Act permitting the registration of unions, there were only 29 registered unions with an aggregate membership of about 100,000. In other words, the movement has shown an expansion by nearly 400 per cent. in the course of a little more than a decade. The figures are even more satisfactory in comparison with those for the year immediately preceding 1938. The increase in membership was from 257,000 to 390,000 and in income from nearly Rs. 5 lakhs to Rs. 7 lakhs There is no doubt that the inauguration of provincial autonomy, the larger representation accorded to organized labour in the various Provincial Assemblies and the diminishing signs of hostility on the part of several employers towards trade unionism have resulted in a more active spread of the movement in recent years.

But how unsatisfactory even now are the conditions is apparent from the latest reports. The movement has taken firmer roots in Bombay than in any other Province; but even in Bombay 23 per cent. of the subscriptions represent unrealized assets, and if 11 unions with few outstandings be excluded from the calculations.

(Continued on p. 251)

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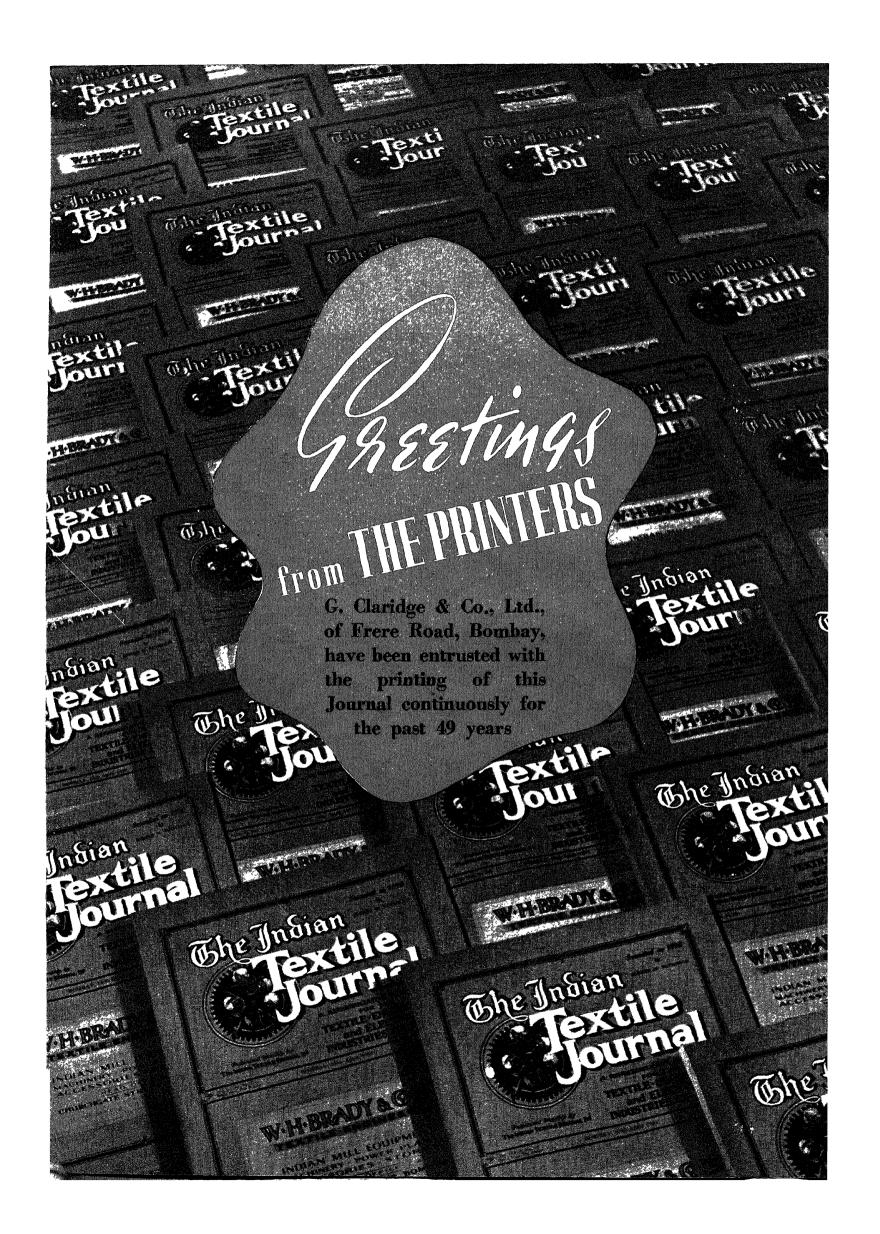
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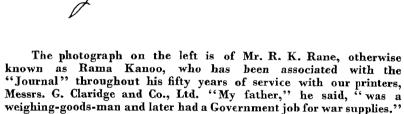
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I am now 84 years old but I feel pleasure to see that there are younger men to carry on the business for many more years to

and

come. With all





- "Which war could that be "?
- "I don't know. They were probably preparing for this one."
- "When were you born, Mr. Rama Kanoo?"
- " About 1875."
- " About 1875?"
- "Yes-about. At the age of 13 I came to the Caxton Press and a couple of years later, I handled a copy of the "Indian Textile
- "What did you get as pay?"
- "There was no pay in those days," he smilingly replied.
- " No pay?"
- "Only after three months did I get my first salary."
- "What was that?"
- "Five rupees-but it went much further than it does now. Those were different times. Now everything has changed. I remember how we used to publish the "English Mail"—one hour after the arrival of the boat. The matrices used to come ready and while the boat was still in the stream, we used to go alongside in a "toni" and fetch them. Then dash back to our office and in an hour or so the paper would be in the streets."
- "What news would that contain?"
- "News of England, but it was generally about 21 months old."



"R. K. RANE"



Such is the man who has been associated with this "Journal" for all its fifty years. Somehow the destinies of the two are bound together and to him goes the credit of having nursed it in the printing press even as Sorabji Rutnagur nursed it from his editorial desk.



AMERICAN COTTON WORK IN THE PUNJAB AND SIND

Bv

Sir WILLIAM ROBERTS, C.I.E., M.L.A.

THE first attempts to introduce American cotton into India occurred in the 40's of last century when twelve American cotton planters were imported and dispersed over various parts of India. The only permanent success achieved was in Dharwar in the south of Bombay, where the Dharwar American cotton was fairly established in the Dharwar District. It is interesting to note that "saw-ginning" was established also in this area and is still in vogue. The saw-gins are country-made. The total production in Dharwar from about half a million acres is generally under one lakh of bales. Traces of this early effort are to be found also in the Bani American found here and there in the Central Provinces and in stray plants American found in the Punjab even as late as 1904-05 Cambodia cotton was introduced into Madras from French Cambodia at the end of last century. It has attained an important, if limited success, and is now grown on irrigated land and rain conditions. The total crop is from one to three lakhs of bales from an area ranging from 3 to 5 lakhs of acres.

With the new conditions developing with the construction of the Lower Chenab Canal in 1893 and Lower Jhelum Canal in 1901, conditions were suitable for work to be restarted in the Punjab; but it was only when the Agricultural Department was created by Lord Curzon in 1905 that systematic attention could be given to this important work. The late Rai Bahadur Mela Ram, father of Rai Bahadur Ram Saran Das, C.I.E., M.C.S., gave a stimulus to this work by suggesting tests with stray American plants found growing in desifields. He offered prizes and subsidies for pure American grown by zemindars.

Seed Selection

A large number of selections were made by Mr. A. C. Dobbs, then Principal of the Punjab Agricultural College, in 1907 and 1908, and these were further developed by Mr. Milne, late Economic Botanist, to whom the botanical work was transferred in 1908. When the writer came to the Punjab in 1909 after experience in Bihar and Dharwar, a few hundred acres only of American cotton were being grown in the canal colonies. The system of auctions to secure a fair price was started by Mr. Milligan, then Deputy Director. In those early auctions held at Lyallpur, only two or three dozen carts of American cotton could be collected even as late as 1911. By 1913, however, two types, viz., 3F and 4F selections had been put out. It is lucky that both were tried on a fair scale, for though the Government Farm tests had shown 3F to be superior, it failed badly with zemindars, owing to Jassid attack, whereas 4F, of which only a couple of hundred acres had been put out, stood up well. The seed of 4F was carefully collected and some 3,000 acres were grown in 1914. In the meantime, in Jhang District the zemindars had made their own selection from surviving American plants of the Narma type found in desi cotton and by 1916 several thousand acres were already grown in Jhang. Owing to the war, prices in 1914 fell disastrously, but while desi cotton

fetched only Rs 3 to Rs. 4 a maund of 82 lbs., the American fetched Rs. 6 to Rs. 7 There was a rush to grow American in 1915 and subsequent years.

Auctions

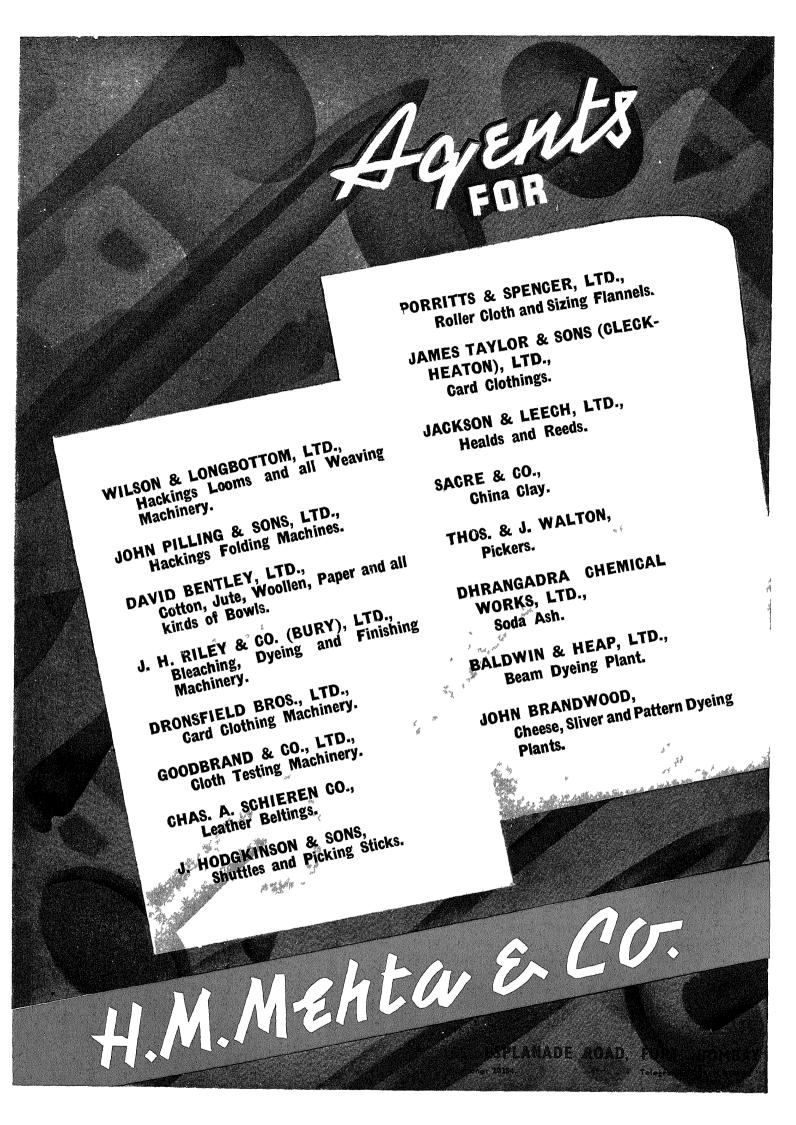
The auctions controlled by the writer from 1912 onwards grew steadily in importance and by 1918 they were held in three or four centres and a total of over 40,000 bales were sold by auction in 1918. The area under American by the end of the Great War was at least half a million acres. In 1920-21, when for the first time separate figures for desi and American were available, the area had reached 800,000 acres or 4 lakhs of bales. In 1921 the writer first grew 289F at Khanewal, from seed obtained from Lyallpur College, on the Lower Barı Doab Canal, opened in 1914-15. It stood up well in comparison to 4F and had a staple of 1 h "as compared to 7/8" for 4F. By 1925 several hundred bales were being grown, mainly on B.C.G.A. farms controlled by the writer and later by other big farms such as Colevana, Renala, Convillepur and Igbalnagar—all on the Lower Barı Doab Canal. After 1927 practically no 4F was grown on B.C.G.A. Farms, except what had to be grown for Government seed.

Selection Work in 289F Types

In 1927 the writer secured the services of Mr. Roger Thomas, now of the Sind Land Development Limited, and started selection work in 289F. By 1928 at least 10,000 bales of 289F, were already being grown. Two of the hundreds of selections made between 1928 and 1932, viz, 289F/K25, 289F/K23, proved very successfulparticularly K25 which had a ginning percentage of 34 per cent. as compared to 30 per cent. for 289F. It was also a good yielder even in years when Jassid and white-fly pests were prevalent It spread rapidly through its own intrinsic worth and was grown to the extent of 120,000 bales in 1939. It proved successful also along with 289F/K23 in Sind and in Bahawalpur. 289F selections had been chiefly successful in the Lower Bari Doab Canal and Sutley Valley Canals and made but insignificant progress in the Lower Chenab or even Lower Jhelum Canal areas A selection from 4F found by Sardar Sahib Labhsingh (called L.S.S.), has been very successful in these two latter colonies. Its staple is between 4F and 289F and production last year reached 80.000 bales.

Sind Work

In Sind, early attempts were made even in 1906 and 1907 in the introduction of Egyptian cotton. This was a failure as Sind really had no perennial canal. With the completion of the Lloyd Barrage in 1930 the stage was set for solid progress. In the main, Sind got its seed from the Punjab. Even to-day, though the Agricultural Department have a good type in 289F selection, "Sind Sudhar" and 4F 98, the bulk of Sind American is still grown from Punjab seed. The area under American in Sind in 1939-40 reached 4 lakhs acres, of which over $2\frac{1}{2}$ lakhs was 289F type and about $1\frac{1}{2}$ lakhs 4F or (Continued on p. 237)



REVIEW OF THE COTTON TRADE OF INDIA

By
M. D. ALTEKAR, M.A

THE earliest Statistical Abstract published in India gives some figures for the year 1841, but as far as cotton statistics are concerned, we get figures only from the year 1849 It is evident, however, that the cotton trade was taking shape in the decade before, and it is a historical fact that India was the home of the cotton textile industry for centuries earlier. It is needless to go now into the history of how England tried in the early days to crush that old industry in this country and to substitute her own new industry worked by machinery at Manchester The point is that when the first cotton mill was put up in Bombay about a century ago, it was the birth of a new industry altogether. It is rather interesting to remember that in the year 1849, the total imports of cotton goods including apparel, twist and yarn and manufactured goods cost India Rs 3,33,79,520 At the same time, the exports in the same year, including apparel, raw cotton twist and yarn, and manufactured goods totalled Rs 2,46,58,930 Out of this raw cotton of the value of Rs 1,77,53,090 was exported while the rest, worth about Rs 61 lakhs, roughly, was twist and yarn and manufactured goods all put together From these small beginnings, the cotton trade of India has grown from stage to stage and has assumed big proportions, particularly after the great war that raged in Europe during 1914-18 It is intended in this article to take a brief review of the trade for the four decades before 1890 and then to study in a detailed manner the growth of that trade during the last half a century. The story of the cotton trade of India in modern times is a fascinating one, though it is not without its vicissitudes. The ups and downs, however, if rightly understood, will be useful for future guidance Above all, the cotton industry is now a key industry of India and one of the main producers of wealth

The trend of the cotton trade for the dozen years ending 31st March 1860 can be clear from a detailed study of the figures for that period. The value of imports of apparel, twist and yarn and manufactured goods was, roughly, in lakhs of rupees, for those dozen years 334 470, 498, 644, 508, $604\frac{1}{2}$, 701, 670, 650, 613, 1,036 and $1,211\frac{1}{2}$, respectively So from three crores in 1849, the figure jumped up to twelve crores in 1860 which means that the increase was somewhat less than fourfold The export figures of the same dozen years also make instructive reading, the figures were, in lakhs of rupees, 247, 294, 415, 444, 456, 357, 325, 410, 232, 511, 490 and 640 respectively Even from a glance at the figures it should be obvious that from about Rs 21 crores the figure went up, at the end of twelve years, to about Rs $6\frac{1}{2}$ crores, the last figure being about two and half times the first figure, apart from the fact that they are small figures compared to the imports. We might look a little carefully into the exports of raw cotton and of manufactured goods during the interval India exported raw cotton worth about Rs 13 crores in 1849 while in 1860 she exported raw cotton of the value of more than Rs 51 crores That means the exports of raw cotton about trebled during the twelve years. It must also mean that cotton cultivation was developing in the land, and that the market outside India for the crop was steadily growing. When we look to the figures of manufactured goods which include twist and yarn, we find that in 1849 India exported goods worth about Rs. 70 lakhs while in 1860 the figure is about Rs. 76 lakhs. The highest figure of export during the period occurs in 1853 which is Rs. 93 lakhs. This means that the rise in exports was less than 50 per cent, even looking to the maximum during the period and India was barely 10 per cent, better off at the end of the period. India was, at the time, obviously backward in production and had not developed markets outside the country. The careful study of these early figures, therefore, brings before our eyes the comparative positions of our imports and exports, and we can safely say that at that time the industry was infant indeed.

Between 1860 and 1880

During the decade that followed, there were three boom years as far as the export of raw cotton was concerned The export of manufactured goods, including twist and yarn, continued at a slow pace, indicating that the industry was still in its infant stage. The value of the exports of raw cotton, in crores of rupees, during the ten years ending 1870 (31st March) was, respectively, 7 3, 10 2, 18 8, 35 9, 37 6, 35 6 16 4, 20 1, 20 2 and 19 1 The value of the total exports in the cotton trade for the same period was in crores of rupees 8 l, 11 0, 19 6, 37 0, 38 7, 37 3, 17 6, 21 5, 21 5, and 20 4 When we compare these two sets of figures with the import figures we realize that India was an excellent market for British manufactures and was miles away from being an industrial country. The total value of exports mainly meant the value of the exported raw cotton In the matter of imports however, it was all manufactured goods including twist and yarn. The value of total imports in the cotton trade during the decade under notice, in crores of rupees, was 11 4, 10 6 10 0, 12 4, 13 8, 13 9, 15 5, 18 1, 19 3, and 16 7 This shows that the import trade was steadily growing It remained, however, almost stationary during the next ten years (1871-80) and the value of total imports, in crores of rupees, was 19 5, 18 0, 17 9, 18 4, 20 0, 19 9, 19 2, 20 7, 17 4, and 20 2 The value figures for exports of raw cotton, in crores of rupees, during the period, were 19 5, 21 3, 14 0, 13 2, 15 2, 13 3, 11 7, 9 4, 7 9, and 11 1 The value of total exports, similarly, was, 20 9, 22 5, 15 4, 14 8, 16 9, 15 0, 13 7, 11 7, 10 5 14 0 All this shows that during this decade even the export of raw cotton dwindled, and of course, there was not progress worth mentioning in the export of manufactured goods Rs 14 crores of exports in cotton trade ın which raw cotton was valued at Rs 11 crores,—this does not show that even by 1880, India had started becoming an industrial country. In the island of Bombay, the cotton textile mills were gradually growing, but at a slow pace. The doctrine of free trade was implicitly believed in even by those who were actually engaged in or connected with the textile mills, and by leading politicians The birth of the Indian National Congress was to take place about five years later, and industry was still outside politics

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1881-1900

From 1881-90 the imports went on increasing, indicating that India was consuming more and more foreign goods, in spite of the fact that the cotton textile industry was also making progress in this country. That again meant that the Indian people were using more and more piecegoods than they were accustomed to do in earlier days. India is a warm country, and the need of good clothing is felt only in winter months, and that too, in the northern parts of the country, for the simple reason that in the south, i.e., in the Madras Presidency, there is real'y no winter. Let us now look to the import figures during the decade 1881-90. In crores of rupees, they were 27.3, 24.6, 25 6, 26 0, 25.4, 25.3, 30.3, 28.8, 32.7, and 31.2 There are fluctuations, but the fact is clear that from a Rs 20 crore average during the preceding decade or two, India went to a Rs. 30 crore average. We may now glance at the exports. The value of total exports in cotton trade during the decade, in crores of rupees, was 16 3, 18 3, 20.0, 18 7, 17 8, 15 9, 19 3, 21.3, 23.2, and 27 3 The last figure looks big but it is far above the average of that decade and the one that followed. Now these tot 1 figures include the figures for the export of raw cotton which were as follows (in crores of rupees): - 13.2, 14.9, 16.0, 14.4, 13 3, 10.8, 13 5, 14.4, 15.0, and 18.7. The last figure is also much above the average of the decade. Raw cotton was being exported but not on the large scale that came to be a feature of India's foreign trade in later times when Japan came into the market as a customer. With regard to the export of Indian manufactures, the figures for twist and yarn were (Rs. crores) 1.3, 1.4, 1.9, 2.0, 2 5, 2.8, 3.4, 4.1, 5.3 and 5.8 while the figures for piecegoods were (Rs. crors) 1.8, 1.9, 2.1, 2.3, 2.1, 2.2, 2 4, 2.8, 2.9 and 2.8. Here we see a little progress but not much of it, and that means that India had not yet started to cultivate foreign markets. Things were to change in later years, but in the days we are discussing, imports were a more important part of our foreign trade than exports.

We now enter the period of the great silver crisis which resulted in the closing of the Indian mints to the free comage of silver. In fact, India shifted from what may be called free currency to managed currency. A controversy arose over the subject at the time and even as late as 1920 and the decade that followed there were champions of the free comage of silver. With regard to the last decade of the last century, the figures are interesting. The total cotton textile imports valued (in crores of rupees) were as follows during the period: 32.3, 30 1, 27 0, 34.2, 34 3, 27.6, 31.4, 27.7, 28.7, and 31.4. We find that the imports have gradually gone up and from twenties they have entered thirties of crores. Another noticeable thing in this decade is the inclusion, in imports, of value figures for raw cotton. The first mention is in the year ending 31st March 1894 and the value figure for that year was Rs. 22 lakhs and odd. The rest of the figures (in lakhs of rupees), were as follows: 20.4, 22 7, 12.7, 10.4, 5.7, 30.8. These figures do not indicate that the imports of raw cotton were on a big scale but they indicate that the imports had commenced and that Indian cotton did not satisfy all the needs of the piecegoods producers in the country. We now turn to exports. The value figures for raw cotton exports were as follows (in crores of rupees): 16.3, 10 8, 12 7, 13.3, 8 7, 14.1, 13 0, 8.9, 7 4, and 6.6. This means that the export of raw cotton went down in this decade. Similar figures for the exports of manufactured goods were as follows (in crores of rupees):

2.9, 3.1, 3 1, 1.3, 1.5, 1.6, 1.3, 1.2, .8, 9. The total figures of the value of the exports are (in crores of rupees) as below.—26.1, 19 7, 22 6, 19.7, 16.0, 22.7, 21.6, 17.9, 19 1 and 18 3. The figures are depressing indeed and do not show satisfactory progress over the figures of the preceding decade. That means that while the imports were steadily growing, the exports were not making headway. The silver crisis and the change in the currency policy, and in particular the uncertainty of the currency policy during the period, also must have contributed to the depression.

After 1900

We shall now turn to the beginning of the present century. People did not quite realize when the year 1901 commenced that before long a new era was dawning upon the world. Queen Victoria died early in January of that year and the Victorian age was over. But within about 15 years' time the world was to enter a crisis; 40 years ago no one even dreamt of it. England was a happy and prosperous country sending her manufactured goods in very large quantities to the distant parts of the world. The imports into India of cotton piecegoods reflect that The value of total imports for the first decade of the present century (in crores of rupees) showed a distinctly upward tendency and the figures were. 32.1, 34.8, 32.4, 33.0, 40.9, 45.2, 43.5, 51.3, 39.6 and 40.8. So, on an average (roughly), there was a definite increase of about 33 per cent, in the imports. Of these, raw cotton still filled an unimportant place, but it was there. And in any case the increase in manufactured goods rather than in raw materials is always unwelcome from the viewpoint of national economy. With regard to exports, similar total value figures were as follows (in crores of rupees): 16 0, 25 5, 25.0, 25.1, 29.3, 36.0, 34.3, 36.7, 31.4, and 43.5. If the imports showed an increase during this period, the exports were also gradually and perceptibly going up, which means that India was producing more and sending more goods abroad. The only fly in the ointment was this, that India was sending abroad more raw cotton than manufactured goods. The following figures will make that clear. Value figures (in millions of pounds sterling to be converted into Rs. at Rs. 15 per £) for exported raw cotton and piecegoods, are given below together with figures for twist and yarn, for the ten years ending 31st March 1910.

	Raw cotton		Twist and yarn	Manufactured goods		
1903 1904 1905 1906		6.7 9 6 9 8 16.2 11 6 14 2 14.6 17.1 13 2 20 9	2 7 2 7 9 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	1.0 1.0 1.1 1.2 1.3 1.2 1.2 1.2		

When we glance at these figures side by side, we find that the process of exporting manufactured goods was an extremely slow one and practically registered no upward tendency. India's exports looked big on account of the growing exports of raw cotton. India was exporting twist and yarn, but she sent out manufactured goods only on a limited scale.

The succeeding decade, 1911 to 1920, included the four years of the world war, years that threw into the background all old notions of economic operations and (Continued on p. 221)



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THE HANDLOOM IN INDIA

Ву

Rao Bahadur K. S. RAO, A.T.I.

Textile Expert to the Government of Bihar

Handloom weaving, the premier cottage industry of India, occupies a position of growing importance in the annals of the cotton mill industry. Till the dawn of the last century, handloom weavers were using charka spun yarn, and fabrics, as thin as gossamer, were produced not only for local consumption but also for export to distant European countries. The series of economic changes and mechanical discoveries in textile manufacture in England towards the closing decades of the eighteenth century—then dramatic enough to be styled the "Industrial Revolution"—resulted in the export of cheap machine-made yarn and cloth from that country to India and to the collapse of the Indian handspinning industry

Spinning Mills and the Handloom

During the latter part of the last century, cotton mills sprang up all along the west coast and other parts of India, and the handloom weavers, who had hitherto used foreign yarn, found a new source at home, from which to procure their raw material The yarn supplied by cotton mills was found to be both superior in quality and cheaper in cost than that spun on the old-fashioned charkas. Consequently, while hand spinning succumbed to economic forces, hand weaving survived and began to consume increasing quantities of millspun yarn; so much so, that at the end of the last century, handloom weavers consumed nearly three-fourths of the yarn spun in Indian mills, the production of which was then about 250 million lbs. on an average. Since then, although there has been substantial development in the spinning branch of the mill industry, with about 400 factories scattered all over the country, the increase in the quantity of cloth woven by them has been phenomenal and the output of cloth in 1938-39 was as much as 4,250 million yards—more than ten times as much as it was 40 years ago. The handloom weavers, working over two million looms, could not, however, take advantage of the increased demand for domestic cloth, and even to-day they weave practically no more than what they used to do before—the increase in their output during the last 40 years being only 40 per cent. In spite of this rapid development of the mill industry, hand weaving is of great importance to it; for, it now consumes annually about 300 million lbs. of mill yarn, which represents one-fourth of the total yarn production and is estimated to cost about Rs. 12 crores

After this brief analysis of the position of hand weaving in relation to the mill industry, the disadvantages of the handloom weavers, who depend on the mills for their yarn, may briefly be stated Partly out of the cotton waste that remains after spinning yarn for power-looms, an inferior quality of yarn is produced for handlooms. This yarn in bundles, known as reeled yarn in the trade, found a market in China for several years. But with the loss of this oversea trade, the mills were left with no alternative but to pass off this inferior yarn to the local handloom weavers and develop this trade. Besides being poor in quality, this yarn is often wound in

short-reeled hanks and packed in bundles, weighing less than the standard of 10 lbs. Again, it is marketed in odd numbers and fractions of counts, which not only confuse the ignorant weavers but also afford an opportunity to unscrupulous retail dealers for making illegal profits.

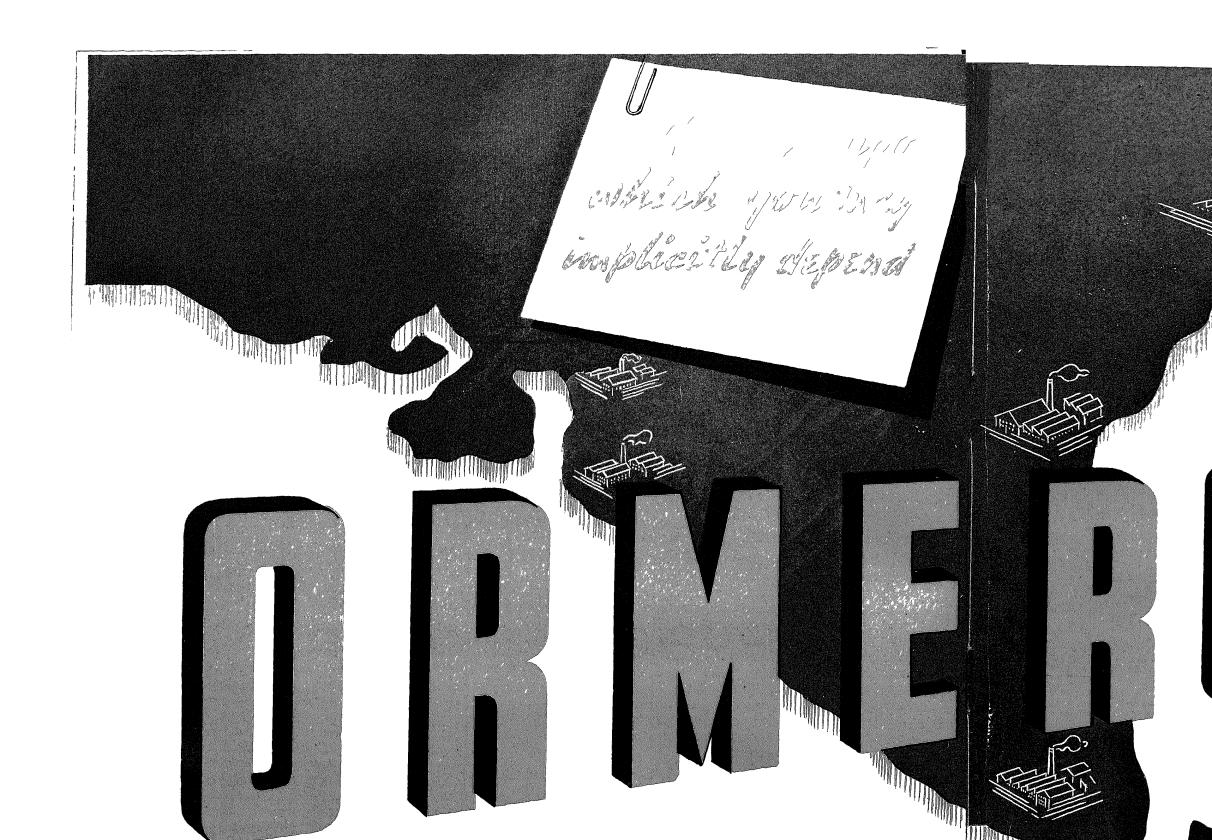
To cite an example, it is common to sell yarn of $10\frac{1}{2}$ s, $16\frac{1}{2}$ s and $20\frac{1}{2}$ s to the weavers as 10s, 16s and 20s, and the half knot is retained by the dealers as their additional profit. Similarly, divers of Turkey-red and aniline black, dive yarn of 22s and 44s but pack only 20 and 40 knots, respectively, of this yarn in each bundle. In some cases, yarn finer than even 22s and 44s is passed off as 20s and 40s. The existence of such fraudulent practices in the yarn trade has been acknowledged by the Bombay Millowners' Association, which about a couple of years ago made certain recommendations for the consideration of the Government of India, in the interest of both the handloom weavers and the cotton mill industry. (For further details *nide* page 260 of the *Indian Textile Journal* of April 1938.)

Competition Between the Two Branches of the Industry

Since the end of the last century, the cotton mills have been extending their local markets for cloth in the absence of an export trade, with the result that the poor handloom weavers are being ousted out of their hereditary trade even in the production of such coarse goods and specialized types of fabrics as were their monopoly. A study of the different types of dress that are worn in India might convey the false impression that cotton mills cannot profitably meet the varied requirements of the people in the matter of clothing, and that it would therefore be more economical to manufacture them on handlooms. But the bulk of handwoven cloth, particularly that of Northern India, is of plain weave and of coarse grey yarn and the demand for this cloth -"the bread and butter" line of hand weavers-is fairly large, so that the mills have found the manufacture of it on power-looms easy and profitable. A visit to the village hat or shandy where villagers purchase large quantities of machine-made cloth, would convince one of the truth of this statement. No one expected that the aborigines and hill tribes would give up their traditional dress of thick hand-made cloth for the cheap prints and bleached fabrics of the mills. But they follow the trend of the day and imitate the fashions of the other classes of the community.

Even the specialized lines of dyed fabrics such as saris and susies of skilled workmanship, which used to be manufactured only on handlooms, are falling out of use. The womenfolk of South India who once used to array themselves in the gorgeous apparel of handlooms are now led, partly by poverty and partly by changing fashions, to lay aside their beautiful old style clothing for one that is cheap and plain.

Recent developments in the mill industry are sufficient evidence to show that there has been no dearth of competition, either in respect of coarse grey goods or specialized types of fabrics, between the two classes of (Continued on p. 223)





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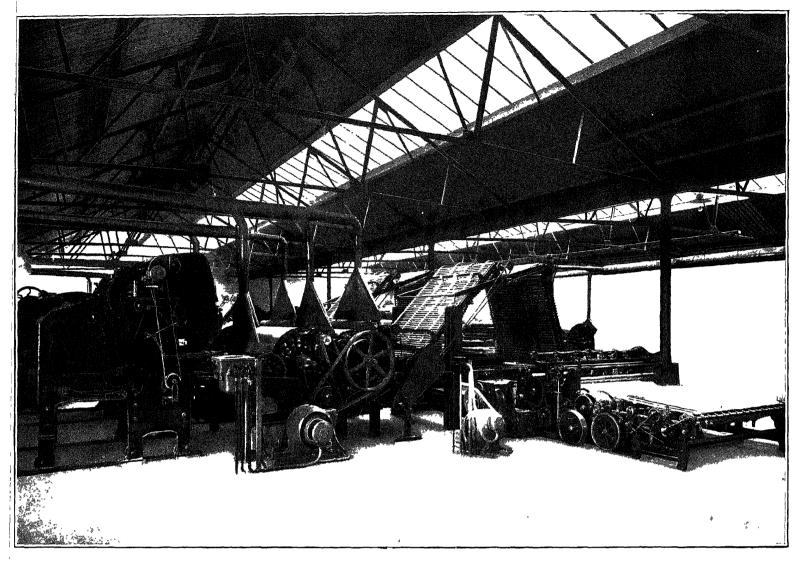
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HANDLOOM vs. POWERLOOM

Βv

V. K. R. V. RAO, Ph.D. (Cantab)

Principal and Professor of Economics, S. L. D. Arts College, Ahmedabad

PEOPLE in India are so much impressed by the importance of the cotton mill industry that few of them realize that handloom weaving is still an important branch of the Indian textile industry. As a matter of fact, even in the year 1939-40, handloom weaving supplied as much as 160 crores of yards of cloth, or 29 per cent. of the nation's total output. Moreover, handloom weaving in India has had an amazingly tenacious existence such as is found in no other country in the world; not only that, it has actually recorded a considerable increase in output during the last 40 years. The following table gives the relevant facts:

Output

		(In c	rores o	f yards)			
Quinquennium ending— Quinquennium ending—							
1904–05	••	••	85	1924-25		••	119
1909–10	• •		107	1929-30			132
1914–15			105	1934-35			150
1919–20			86	1939-40			147

Even at the rate of 3 annas a yard on the average, the value of handloom-woven cloth in the last quinquennium would come to Rs. 28 crores, while the number of people maintaining themselves by this industry either partly or wholly is estimated at several millions of persons. The total number of looms making cotton goods in the country, excluding Burma, is placed at 1½ millions, details for Provinces being as under:

		(Fi	aures	ın thoi	usands)		
Madras		••`	~ · ·	259	Bihár and Orissa	• •	180
Bengal	• •		• •	100	Punjab		242
Bombay				110	Central Provinces		73
United Pro	ovince	es		162	Assam		421

The figures for Assam appear to be an overestimate; but even allowing for this, there is no doubt that the number of handlooms at work in the country is several times larger than that of powerlooms. Thus in point of the number of looms, the number of persons they give employment to and their territorial distribution, it is evident that handloom weaving is even more of a national industry than the mill section of the cotton textile industry; and as such it is deserving of support on a national scale.

Is the Handloom Industry Prosperous?

It may be contended that the continued existence of the handloom weaving industry and its record of increasing output are both signs of its prosperity and, therefore, nothing special need be done to help this industry. But this would be a superficial view. As the Textile Tariff Board pointed out in 1932, "Since the handloom weaver cannot regulate his production according to the state of the market without risking starvation for himself and his family, the true criterion for judging the position of the handloom weaving industry is not the proportion of the quantity of cloth woven on handlooms to the total production but the wages earned by the handloom weaver." The Board expressed the opinion that judged by this test the handloom weaver's condition had to be regarded with concern. Since then, the position has deteriorated further, as can be seen from the following table of piece wages, taken from the

Report of the Bombay Economic and Industrial Survey Committee :—

Kınd of <i>saı i</i>		1	925	3		193	8	Decline in percen- tage
Sholapur— Pharaspeti (8 yds × 45") (30s) Ilkal (8 yds × 45") 30s. Nepani (8 yds × 45") (30s 24s) Maheshwari (8 yds × 45"). (60s 40s)	•••	1	8	0 0 0	0 0 0	7 5 7 9	0 9 0 6	70 59 50 48 Decline in percentage
Nasik— Maheshwari border	•••	1 2 8 10	a. 0 0 8 4 0 0 to 0	p. 0000 00 0	Rs. 0 0 0 0 2 5	a. 65510 800	p 00000 0	81 80 79 72 69 50 to 58

In fact, the handloom weaver's average of monthly earnings is now tending to reach that of the unskilled labourer; and the Bombay Report puts his average income at only Rs. 8 per month. Everywhere the handloom weaver complains of competition, falling prices and inability to dispose of his output at an economic level. The very increase in his output is a sign of his growing distress and testifies to the poverty of the people and the lack of alternative occupations. There is no doubt that handloom weaving in India to-day is a distressed industry and as such stands in need of public and Governmental support.

The Government of India Grant

Nothing was done by the Government of India in this direction till the year 1935 when they made a grant of Rs. 5 lakhs a year for a period of five years to the Provinces in order to help their handloom weaving industry to obtain better marketing facilities. The share of the Bombay Province in this grant was Rs. 39,000; and this was utilized by them for starting industrial associations which helped in facilitating the marketing of the handloom weaver's output. But the quantitative results obtained by this were exceedingly small. The number of persons affected was only 2,000 while the total value of sales including raw materials and finished products came to a little more than Rs. 1 lakh Representatives of weavers who appeared before the Committee deprecated the immediate effectiveness of this kind of assistance and pleaded for more direct help in the form of a subsidy, or, in the alternative, a statutory division of the domestic market with the mill industry. The Committee found themselves unable to consider in detail these and other suggestions to help the handloom

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weaving industry on the ground that "all such actions restrictive in some measure or other of the activity of large-scale industries inevitably raise inter-Provincial and inter-State questions which cannot be solved by the unilateral action of a single Provincial Government" They suggested, therefore, that "this question should be referred by the Bombay Government to a special conference of the representatives of the Government of India and the Provincial and State Governments in the country and provincial action should follow the lines of an agreed policy that such a conference may adopt."

Government Take Initiative

The Government of India took the initiative, therefore, in this matter and brought this question of the conflicting claims of handlooms and mills before the Industries Conference at Lucknow on 16th and 17th December. In their circular letter to the Provincial Governments and Millowners' Associations inviting their views on this subject, the Government of India mention six suggestions they have received, which are as under.

- (1) Excise duty on mill cloth.
- (2) Terminal tax on mill products.
- (3) Restriction of mill output by prohibiting mills from producing certain classes of cloth
- (4) Cess on mill products.
- (5) Reduction of duty on yarn.
- (6) Fixation of quota and of particular counts between the handloom industry and the mill industry.

I propose to consider below, in brief, the effectiveness of each of these methods and at the same time analyse their effects on the other aspects of Indian economy.

General Conditions

At the very outset, I should point out certain general conditions that must govern any action that is taken to resolve the conflicting claims of these two branches of the textile industry, including all or any of the six methods mentioned above. Any restriction that may be imposed upon machine-made cloth must apply not only to the Indian mill industry but also to imported cloth; if this is not done, there is a grave danger not only of the handloom weaving industry not getting any benefit but also of foreign cloth gaining at the expense of Indian cloth in the Indian market. The second condition which must be observed is that restrictive measures applied to the mill industry must apply to the entire industry in India, including that part which is located in the Indian States; otherwise there is a great risk of the measures merely resulting in benefiting the Indian States' mill industry at the expense of the British Indian mill industry without any advantage accruing to the handloom weaving industry. The two essential conditions that must be observed in the application of any of the six measures detailed by the Government of India are, therefore:

- (1) It must apply to import equally with domestic production.
- (2) It must apply to the mill industry in the Indian States equally with that in British India.

Subject to these two conditions, we may now proceed to consider in brief each of the six suggestions received by the Government of India.

Excise Duty

Take that of imposing an excise duty on mill cloth. The effect of such an excise duty accompanied by a

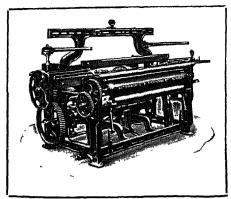
countervailing increase in the import duty on cloth would be to raise the price of machine-made cloth, and assuming that the price of hand-woven cloth did not change, one may expect an increase in the demand for the latter. One cannot, however, be certain of this result. Without the imposition of any excise duty, the advent of the war has seen a considerable rise in the price of mill cloth, at any rate a much higher rise than could be achieved by the maximum excise duty that comes within the range of practical politics; and yet the handloom weaving industry has not benefited very much by this fact. Moreover, the historical associations of this excise duty in India are so unpleasant that it will be exceedingly difficult to get the public to accept the revival of this once-hated impost. Further, the burden of the excise duty will fall on the entire range of mill cloth, some of which may well be not at all in competition with handwoven cloth. I am not, therefore, in favour of imposing an excise duty on mill cloth as a means of protecting the handloom weaving industry. If, however, an excise duty on mill cloth comes into being because of the revenue exigencies of the Central Government, I would certainly suggest that hand-woven cloth should be exempt from the duty; and there would be a precedent for this in the differential rates of excise duty imposed on hand-made matches and machine-made matches

Terminal Tax

The second suggestion, viz., imposition of a terminal tax on mill products is open to the same objection of not necessarily securing any increase in the demand for hand-woven cloth, unless the tax were imposed at rates which would not be contemplated by any Provincial Government. Moreover, it would be more difficult to administer than an excise duty and is also likely to lead to injustice as between one place and another. I would not, therefore, support this suggestion.

The Third Suggestion

The third suggestion is for restriction of mill output by prohibiting mills from producing certain classes of cloth. The types of cloth usually suggested for prohibition for mill production are saris and khans. There is much to be said for this proposal. Saris and khans are produced by handloom weavers all over the country; and the benefit of any such prohibition would, therefore, accrue to the handloom weaving industry throughout the entire country and not merely to that in any one Province. Moreover, saris and khans represent a comparatively recent inroad of the mill industry into the cloth market and there are not, therefore, the same vested interests to be contended against as there would be if the prohibition was to apply by counts of yarn; for such vested interests in this field as have already been created, provision may be made by prohibiting further increases in production of this type of cloth beyond say—the maximum production the mills in question have reached in any one year so far, instead of completely forbidding them to produce any saris and khans. Further, saris and khans are not difficult to define; while in the production of these types of cloth, the handloom weaver is at his best and strongest and would therefore quickly respond to any such help. I would, therefore, urge that serious consideration should be given to the expedient of prohibiting any increase in the production of saris and khans by the mill industry over and above what it is already producing at present.

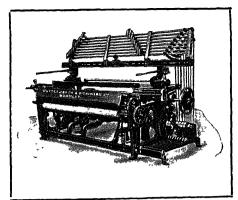


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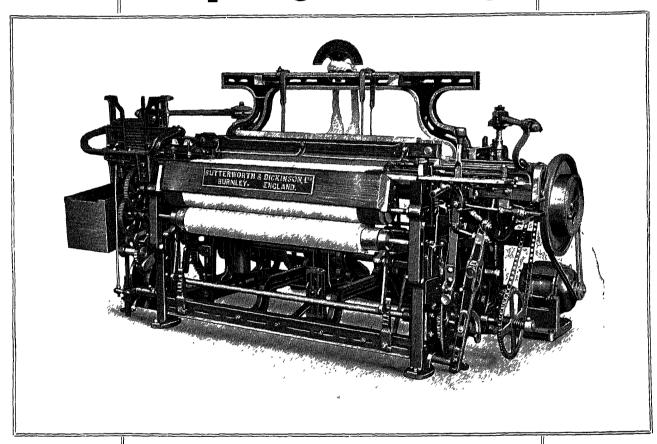
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THE PROGRESS OF ARTIFICIAL SILK IN INDIA

Βv

H. L. T. ASPDEN

THE earliest recorded experiments in India towards combining viscose artificial silk and other varns in the production of fabrics appear to have been those made by Mr. Dhanjishaw Pestonjee Pithawalla, Manager of the Sassoon and Alliance Silk Mills Ltd., Bombay, about 1911-12. These experiments were made merely as a matter of curiosity arising from the characteristic attitude of textile men towards the challenge of anything new There were many setbacks and disappointments before Mr Fithawalla and his assistants succeeded in evolving a satisfactory method of processing and weaving artificial silk yarns. The first samples of fabrics produced revealed the potentialities of artificial silk yarns as a means of providing an attractive fabric at a cost about half-way between silk and the cheaper cotton goods, and an order was immediately placed by Messrs. Raghavji Khimji & Co for a fabric comprising a mixture of cotton warp and artificial silk weft which was marketed under the name "Viola."

Their long and intimate experience of marketing silk goods led the firm of Messrs. Dhanjee Muljee to come forward about the same time with the strong conviction that mixtures of spun silk and artificial silk as well as 100 per cent. artificial silk goods would meet with a ready demand from buyers who could not afford the more expensive silk goods. To the remarkable courage, foresight, and persistency of the great leader of this firm may perhaps be credited the initiating of a demand for a class of goods whose large present-day sales have led to many new silk weaving mills coming into operation in India.

To obtain the lead on new developments in the textile industry is not an easy achievement, but it is far more difficult to maintain that lead. Of managing agents, mill managers, and mill selling agents it may truly be said that they are combinations which do not readily accept defeat. Therefore, it was not surprising to find that technicians of Messrs. Choi Silk Mills Ltd., Bombay, had rapidly developed their own methods of preparation, and were soon in the field combating for supremacy in the originality and beauty of productions from this new yarn. Managers of cotton mills were also far from disinterested, and though seriously handicapped in the unsuitability of their machinery for running artificial silk yarns, by means of inventions and adaptations of their machines, they were not long before challenging as to whether the honours rested entirely with the silk mill technicians. By 1914 several cotton mills were producing fancy goods containing stripes and borders of artificial silk yarns, and had successfully overcome difficulties such as "cockling," tendering in bleaching, dulling due to hardness of water causing soaps to settle on the artificial silk yarn in a white, almost insoluble, powder, and the many problems to be met with in passing these yarns through looms in conjunction with cotton.

A Poona Experiment

While the use of artificial silk was developing in the textile industry, Mr. H. S. Cox and the writer had combined to represent Messrs. Courtailds Ltd. whose

English viscose artificial silk yarns were mainly concerned in these first developments. In 1914 they became associated with Mr. Gordhandas Nathalal in an endeavour to interest handloom weavers. First attempts to demonstrate shooting artificial silk weft across a spun silk warp proved a complete failure owing to the yarn sloving off the loosely wound charka pirns. This experiment took place in a small village on the outskirts of Poona, and I recall to mind the dejected mood in which the two Indian and Lancashire textile experts concerned departed to think things out at their hotel in Poona. There, the conclusions reached were that there was little or no hope of handlooms making use of artificial silk weft until something different to the charka-wound spool could be introduced. Anyhow, two days later, a further visit to the village was undertaken and, very much to their surprise, it was found that the handloom weaver had arrived at his own solution of the problem by soaking the spools in a tin of water before using them. The use of artificial silk yarns spread very rapidly in handloom districts when the weavers found warps of this yarn offered no difficulties if prepared and dressed in the manner they were applying to silk warps.

Pioneers of the Trade

Developments in the importation and distribution of artificial silk yarns have been no less interesting. Pioneers in this branch are to be found in such famous names as Messrs. E. D. Sassoon & Co , Ltd., Forbes, Forbes, Campbell & Co., Ltd., Allen Bros. Ltd., Grahams (India) Ltd., Gorio Ltd., Francesco Glanzmann, Symington Cox & Co., Ltd, Greaves Cotton & Co., Ltd., and other Bombay firms As the volume of imports increased competition for sales led to considerable fluctuations in prices which was often a cause of serious losses to merchants and mills, and tended to hinder healthy developments of the business of manufacture and sales. With a view to stabilizing the trade, Mr. T. V. Baddeley and the writer initiated proposals for agreement among importers to establish uniformity of prices, terms, and selling conditions in India. Their efforts were subsequently brought to success by the able co-operation of Messrs. Morley-Fox, Carlo Davies, Lush, Shepperd, Kidson, and L. A. Bund on behalf of importing firms, and such stalwarts of the trade as Messrs. Sakalchand G. Shah & Co.. Gordhandas Nathalal, Gordhandas Ishwardas & Co., Haji Hassan Dada, and Nagindas Baloobhai who brought distribution throughout India on to sound practical lines. Japanese importing houses were not parties to these arrangements, but the fine spirit of co-operation between manufacturers in Japan appeared to have already brought about uniformity of their prices for home consumption and export. In consequence, the final grouping of firms interested in importing and selling the yarns manufactured in Europe, brought the position to the stage where, while there remained intensive healthy competition between Japanese and European manufacturers, the contending parties might be said to have carefully regulated prices so as to avoid undue losses to users. In the fiscal year 1924-25 imports

(Continued on p. 231)



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ARTIFICIAL FIBRES AND THEIR FUTURE

Bv

G. S. KASBEKAR, M.Sc., Ph.D. (Manch.)

THE attempts made by man to produce artificial fibres form one of the most romantic chapters in the history of textiles Vegetable and animal fibres belong to the field of organic chemistry and, the synthesis of naturally occurring compounds from simpler substances being a well developed branch of the same, it is not surprising that, as soon as chemists understood the essentials of the chemical constitution of natural fibres, attempts were made to produce artificial ones. In addition to the inherent curiosity of man, other factors as well have contributed to the progress made in this direction and amongst these may be mentioned the deficiency of natural fibres in certain countries and their desire to be independent of imported goods. The earliest attempts to produce artificial fibres date back to the last quarter of the nineteenth century and their commercial production did not commence until the beginning of this century, so that one could safely assert that the artificial fibres known to-day are younger than this Journal itself.

Although it has been stated that chemists and industrialists attempted to synthesize substances having the same chemical constitution as the vegetable and animal fibres, it must be emphasized at the very outset that all these attempts have invariably failed and the artificial fibres known to-day are either substances which have constitutions similar to those of natural ones or are fibres which are regenerated from naturally occurring fibrous material of little textile importance. Of the three important textile fibres—cotton, silk and wool—the latter two hold a place of greater importance than cotton chiefly because of their unique properties. Consequently, the aim of the artificial fibre manufacturer has always been to produce fibres which resemble silk and wool.

Whilst cotton is purely a vegetable fibre, silk and wool are animal fibres and the former differs from the latter two in the presence of the element nitrogen in it. In the production of artificial fibres, therefore, the goal has been either to produce fibres not containing nitrogen, yet having certain properties which make them resemble animal fibre, or to produce fibres containing nitrogen from non-fibrous nitrogen-containing materials. The typical artificial fibres which are on the market to-day fall into the above two groups. To the former class belong the various artificial silks which are produced from cellulosic materials and to the latter the artificial wools produced from casein or other proteins and also the recently reported fibres from synthetic resins.

Artificial silks, unlike the natural silks, are non-nitrogenous and are only celluloses which are regenerated by special techniques so as to give the finished product a glossy appearance and a silky feel. Regenerated cellulose can be prepared from all varieties of cellulose, but only those prepared from high grade cellulosic material give a product which can be used for the manufacture of fibres of textile importance. Usually high-grade wood cellulose or cotton waste or cotton linters are used for this purpose. There are three distinct methods of obtaining regenerated cellulose. In

principle they are all similar and consist firstly in the preparation of a solution of cellulose in a suitable solvent and then coagulating the dispersed mass in a coagulating bath so that the dissolved cellulose is regenerated. The regenerated material is obtained in a fibrous form by the application of a longitudinal pull on the material during coagulation. The artificial silks obtained by the three methods referred to above are named differently to designate the method of their preparation. The three varieties are Chardonnet silk or cellulose nitrate rayon, Pauli silk or cuprammonium rayon and viscose.

Cellulose Nitrate Process

Of these three processes for the manufacture of art silk the cellulose nitrate process is the oldest and originated in the work of Swan, who exhibited some silk denitrated, as early as 1882 In 1884 Comte Hilaire de Chardonnet took out his first patent in France and this was followed by displays of this material at the Paris Exhibitions of 1889 and 1900. In brief, the method consists in treating cellulose for two hours at a temperature of 24° C, with a nitrating mixture containing 20-21 per cent. nitric acid, 61-62 per cent. sulphuric acid and 17-19 per cent water, to form a cellulose nitrate which is soluble in a mixture of alcohol and ether. The nitrate is washed with excess of water to remove the sulphate and the free acids and then hydro-extracted to let 25-28 per cent. water remain in the material This material is then dissolved in an alcohol-ether mixture to form a viscous solution which is filtered through presses and then extruded through fine orifices to form filaments. Individual filaments are weak, and, therefore, 10-25 are allowed to combine to form a suitable thread which hardens on account of the evaporation of the solvent and is improved further by extension. The filament formation is done by the wet spinning process or by the dry spinning process. The former requires 10-15 per cent. concentration of nitro-cellulose and is easier to filter, whilst 20-25 per cent. solutions are required for the latter. The threads obtained by either processes are wound in hanks and denitrated by means of ammonium hydrosulphide or calcium hydrosulphide in a 3 per cent. solution at 40° C. for about three hours, when the nitrogen content of the thread falls from 11 per cent. to 0.05 per cent. and regenerated cellulose is obtained. During the process there is a loss of 30 per cent. of cellulose and its tensile strength falls by 25 per cent. The finished product is the cellulose nitrate rayon which is soft as natural silk, and has great affinity for basic dyes. Sulphite cellulose is not a suitable raw material for this process and, therefore, cctton linters, boiled in alkalı to remove wax and other impurities and mıldly bleached and dried to less than 1 per cent. moisture, are exclusively used.

Cuprammonium Process

The history of the cuprammonium rayon dates back to a French patent of Depisses in 1890, which was commercially exploited by Vereinigte Glanzstoff—Fabriken A.G. of Elberfeld for the production of rayon, only when Pauli repatented the process for making filaments from



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cuprammonium cellulose solution. This firm used bleached cotton linters and treated these with Schweitzer's reagent (obtained by the action of ammonia, water and air on electrolytic copper) to obtain a 6-8 per cent solution which was then forced through spinnerets under 1.5 to 2.0 atmospheric pressure into a coagulating bath containing 30 per cent. caustic soda with 6 per cent. sugar or sodium lactate. As the finished product gave always a coarse filament its manufacture was discontinued in 1914. Production of very fine filaments was made possible by the patents of Thiele which were worked out by J. P. Bemberg A.G. of Barmen-Rittershaven. In this process beaten cellulose is intimately mixed with freshly precipitated cupric hydroxide to form cupric hydroxide cellulose which is soluble in concentrated ammonia Freshly precipitated cupric hydroxide is obtained by the addition of caustic soda to a solution of copper sulphate until all the copper is precipitated The thick liquor is mixed with beaten linters for thirty minutes and then pressed and washed free from sodium sulphate. The cake thus obtained and containing 40 per cent. water is squeezed through sieves to form fine threads which are subjected to a vacuum in order to remove enclosed air and then treated with strong ammonia to obtain a concentrated solution. This solution is then diluted to 7-8 per cent. cellulose by the addition of ammonia and then forced through spinnerets as before in a coagulating bath. Filaments are produced by the stretch spinning process, the essential feature of which is that the spinning solution emerges under slight pressure from the spinnerets into a feebly coagulating liquid such as water which moves with increasing speed in the direction of forming filaments. The filaments are thus initially completely solidified and then stretched by means of rapidly flowing coagulating bath and by a mechanical device. The filaments when drawn to the required fineness are coagulated completely by a second bath consisting of dilute sulphuric acid or a solution of a metallic salt such as 15 per cent. 170n sulphate. The finished product consists of filaments which are finer than those of natural silk and possess a tensile strength greater than that of nitrate rayon Cotton linters form the main source of Pauli silk, but of late wood-pulp has been used in England with some success.

Viscose Process

Viscose, the third variety of regenerated cellulose, had its origin in the discovery of viscose solution by Cross and Bevan in 1895 and Stern's patent of 1898 details most of the important features of the manufacture. The method adopted for its manufacture to-day differs very little from the original method and employs almost exclusively sulphite cellulose pulp as the raw material. The pulp is allowed to swell in 17—18.5 per cent. caustic soda at 18-20° C. and the excess of alkalı ıs pressed out from the swollen material. It is then shredded into crumbs and aerated and then treated with carbon disulphide at 30° C when sticky and elastic cellulose xanthate is formed. A 7-8 per cent. solution of cellulose with 6.5—7.0 per cent. caustic soda is made by treating the xanthate with caustic soda and water. After ripening for 4-5 days the solution is filtered, and as in other processes it is extruded through spinnerets into a coagulating bath consisting of sulphuric acid to which is added sulphates of sodium and zinc and a carbohydrate. These additions to the bath help to protect the surface of the newly formed fibre and also assist in the solution of the gases produced. In Lilianfeld process a higher viscosity viscose is used and the coagulating

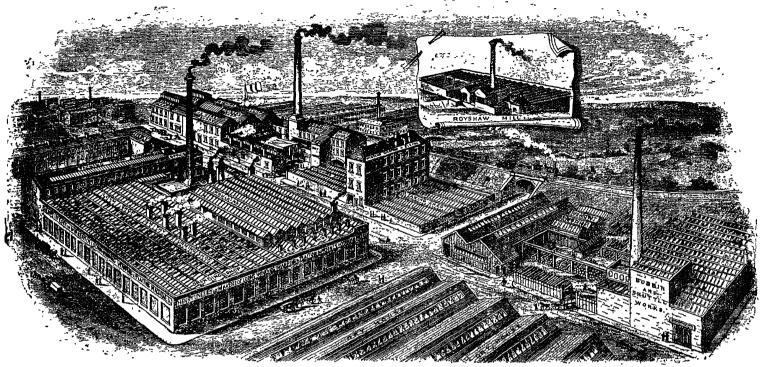
bath is 40—55 per cent sulphuric acid. This modification causes an immediate parchmentisation of the filament as it is formed and thus secures a greater tensile strength for the fibre. The regenerated cellulose obtained by this process is called viscose

A comparison of some of the important properties of these three types of rayons with cotton is of considerable interest. The regenerated celluloses have greater water absorption capacity than the native cellulose Whereas cotton has a moisture content of 6-7 per cent., that of Pauli silk is 9-10 per cent. The hygroscopic moisture content of viscose silk is in the neighbourhood of 10 per cent, and that of nitrate rayon of 10-13 per cent. All these art silks swell in water, the longitudinal swelling being small in comparison with the increase in thickness. The strength of Pauli, Viscose and Chardonnet silks is much less than that of cotton, indicating degradation of the material during regeneration, and this is further greatly decreased by moistening. This decrease, however, can be limited by treating the fibres with sulphuric acid. Chardonnet silk has great affinity for basic dyes, but Pauli and viscose silks, on the other hand, resemble mercerized cotton very closely in their behaviour towards dyes. At one time the dyers were faced with the serious problem of uneven dyeing of rayons, but recent investigations in this field have more or less satisfactorily solved these difficulties and it is now possible to apply the whole range of cotton colours to rayon

In addition to these three varieties of rayon there is another which has received considerable attention from the manufacturers and the public and this is the cellulose acetate rayon. This is not a regenerated cellulose in the same sense as the above three but is a regenerated cellulose ester. Although Miles had taken out a patent in 1905 for the acetylation of cellulose the technical success of the process of manufacture of cellulose acetate silk as a textile fibre is chiefly a result of the work of H. Dreyfus. Successful production of acetate rayon was, however, held up for a considerable time as it possessed no affinity for the dyes then in common use. It was only when this problem of dyeing was solved that a serious production of acetate rayon began. In brief, the process is as follows. Cellulose triacetate is obtained by the action of acetic anhydride on cellulose in the presence of such condensing agents as zinc chloride or sulphuric acid and then changed to the "secondary state"-21 acetate—by a process of hydrolysis with water and acetic acid. This secondary acetate is soluble in acetone and a solution in that solvent is allowed to ripen at a fixed temperature. This ripening is a very important step as it determines the physical properties of the final product. By the addition of a large excess of cold water the acetone soluble acetate is then precipitated in white flakes which are washed, centrifuged and dried at $20-30^{\circ}$ C. The acetate thus purified is then dissolved in acetone and after filtration and de-æration is spun either by the wet or by the dry process. In the wet spinning method the solution is coagulated in the form of a number of fine filaments into baths of oils, hydrocarbons, or aqueous solutions of salts. The thread is collected on bobbins, washed, twisted and reeled as with other methods of artificial silk manufacture. Most cellulose acetate, however, is spun by the dry system, which consists in ejecting a solution of the secondary acetate into a closed compartment, wherein the solvent is evaporated by a current of hot air, drawing action being applied simultaneously to improve the filament. The evaporated solvent is recovered for use with a fresh batch. The (Continued on p. 273) MANCHESTER EXCHANGE: 10 Pillar, | Paris Exhibition, 1878: | London Exhibition, 1884: | Practical Experience in Weaving and from 10-30 to 2-30 on Tuesdays and Fridays. | Prize Medal and Diploma. | Prize Medal. | Loom-making for 36 years.

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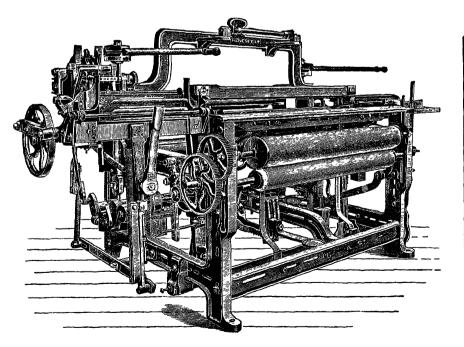


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IN THEIR FIRST ISSUE

IN OCTOBER, 1890

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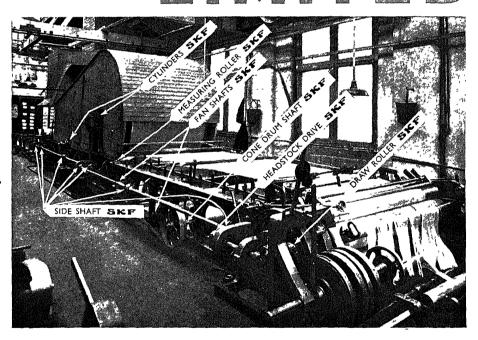
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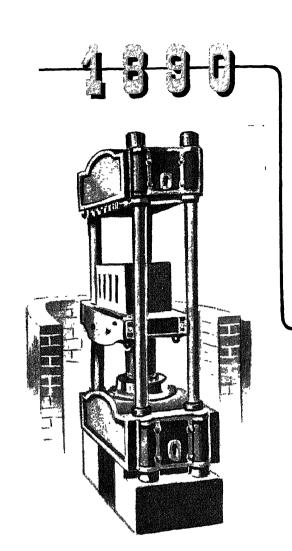


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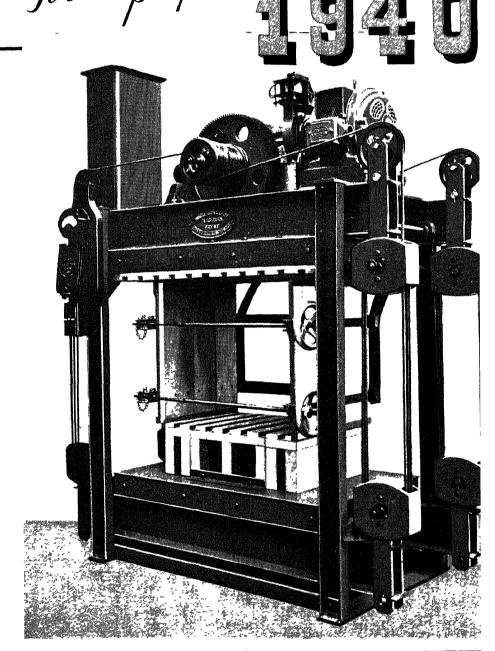
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NON-TEXTILE USES FOR INDIAN COTTONS

Βv

NAZIR AHMAD, O.B.E., Ph.D. (Cantab), F.Inst.P., J.P.

Director, Technological Laboratory, Matunga, Bombay

LTHOUGH India is the second largest cotton-growing country in the world, her cotton crop cannot be regarded as well-balanced from the point of view of all her requirements. Time was when this crop was adequate for supplying not only most of the needs of her vast population, but was also suitable for manufacturing a variety of fabrics which found a ready sale in the world's markets. At that time the masses were content to wear the rough and coarse materials manufactured either in factories or the villages from the short-staple cottons, while her artisans prepared the Dacca muslins and the nainsooks for the enjoyment and use of the rich classes Conditions, however, have altered very considerably since then. The impact of Western civilization, the opening up of new trade routes and the use of quicker means of communication have brought about revolutionary changes in fashions and tastes, with the result that the masses have demanded, to an increasingly large extent, the use of finer and better fabrics. In order to satisfy these demands the Indian mills have had to turn continuously to finer and yet finer counts, as will be seen from the following table which gives the distribution of the counts of yarns spun in Indian mills in the decade 1930-39.

TABLE 1 (In thousands of lbs.)

Year	ls—10s	11s—20s	21s—30s	31s-40s	Above 40s	Waste, etc	Grand Total
1930	112,432	402,833	265,233	56,657	23,612	6,258	867,025
	117,197	428,823	284,328	68,222	33,161	5,174	936,904
	118,123	482,312	305,298	77,566	35,994	5,630	1,024,924
	107,432	451,629	260,117	73,132	36,475	5,646	934,431
	108,673	452,762	273,966	91,201	42,307	5,962	974,871
	110,830	475,859	286,147	111,166	56,557	5,653	1,046,212
	111,905	489,582	274,935	113,813	57,066	7,826	1,055,128
	108,634	481,301	291,024	148,452	81,286	10,133	1,120,830
	134,877	543,322	335,956	167,717	91,613	14,050	1,287,535
	129,539	552,414	324,518	157,201	84,647	15,690	1,264,009

It will be noticed that, whereas the production of yarns of count Nos 1-10 has remained practically stationary, that of yarns having counts 11-20s and 21-30s has increased considerably, while the production of yarns of counts 31-40s has nearly trebled in this period. If, alongside of this increase in the average fineness of the yarns turned out by the Indian mills, it had been possible to alter the character of the cotton crop by increasing the proportion of the relatively long-staple cottons at the expense of the shorter cottons, India's needs for the finer counts would have been met by her own production. But such changes in the character of the cotton crop are not easily possible, especially within a short period of time. It takes many years for a variety to be acclimatized to a particular area. Once this condition is fulfilled this variety has, so to speak, dug its roots deep into the environment of this locality, and it is not an easy matter to replace it with another variety, especially a long-staple one. A good deal of selection work in the field and trials in a technological laboratory are necessary before a new variety can be safely recommended for general cultivation. In some areas it has been possible to introduce new varieties, which are a distinct improvement over the older ones in respect of staple length and spinning quality, but the total quantity of the cottons which are suitable for spinning into fine counts is as yet far below India's requirements. This will be seen by the following table which gives the distribution of India's cottons with respect to staple length and spinning capacity:—

TABLE 2

Staple		Spinning capacity	Production in thousand bales of 400 lbs.
Long: Over 1" Medium. 1" 7/8"-31/32" Short: 11/16"-27/32" 9.16"-21 32" 17/32" and below	 Total	 30's warp 28-32's warp 16-24's warp 12-16's warp 8-12's warp 6-8's reeling	72 181 1,620 829 1,346 1,072 5,120

It follows from the figures given above that, whereas in the past few years India's mills have spun increasingly large quantities of fine counts, the production in India of cottons suitable for spinning such counts has not kept pace with their requirements. In order to fulfil these requirements, it has been necessary to import longstaple cottons from other countries, especially East Africa, America and, to a lesser extent, Egypt At the same time India's production of the short and mediumstaple cottons has far exceeded her requirements with the result that it has been necessary to seek foreign markets for these cottons. We must also remember, in this connection, that although the yield per acre in India has not increased materially in many areas, yet new areas have been brought under cotton cultivation, especially in the Punjab and Sind where new schemes of irrigation have brought water to thirsty land. Consequently, the total cotton available for internal consumption and foreign export has shown a slight tendency to increase, particularly in those years in which the crop has not been adversely affected by bad weather or hostile pests and diseases. As a result, we have to face every year the problem of disposing of a surplus cotton crop, which runs from 1½ million to 2 million bales. Hitherto India has been fortunate in selling this surplus cotton, and, unlike America, we have not been burdened with huge stocks. However, with the stoppage of exports to most countries in Europe, conditions may not be so favourable in the future as they have been in the past, and the problem of disposing of India's surplus cotton may assume a much more serious character.

Disposal of Surplus Cotton

Theoretically, there are several ways of tackling this problem. We may, for instance, advocate a reduction in the acreage under cotton cultivation so as to bring down the production to the level of our requirements in internal trade and foreign exports. It is, however, not easy to put this suggestion into practice without financial aid from the Government in the form of com-

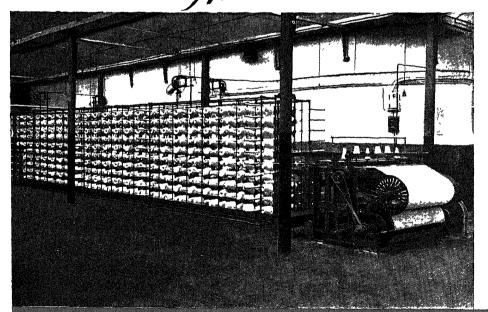
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pensation, especially for the small landlords whose only income is derived from the cultivation of their lands The financial aid required to reduce the acreage to the limit at which the production may meet our requirements would run into hundreds of lakhs of rupees and it is extremely doubtful if it would be forthcoming, especially at the present time. We may alternately consider the possibility of growing in large areas comparatively long-staple cottons which are required by the Indian mills in place of the shorter varieties which mostly form the surplus This suggestion again is not easily practicable There are not many areas which can be changed over from one kind of cotton to another in a short time, and even if a survey of such areas is undertaken and the change effected, it is doubtful if it would solve the problem completely. As a third alternative, we may consider the desirability of the Indian mills using larger quantities of Indian cottons in place of the imported varieties. In this connection we must remember that the consumption of Indian cottons in our mills has been increasing steadily in the past, but that these mills are, in a sense, compelled to use a certain quantity of foreign cottons for the manufacture of those fine yarns and superior fabrics for which there is a growing demand in the country. We may next consider the alternative of increasing the consumption of cloth in India by her population, so that a larger proportion of the cotton in the country is used up for this purpose. This alternative should offer a good prospect of success because the consumption of cloth per head in India is at present very low as compared with other countries as will be shown by the following table, which gives the figure for 1936

TABLE 3

,	Countr	nes		Yds per head
Sweden Argentina Denmark Norway New Zealand Canada Austraha S Africa S Rhodesia Ireland Greece India and Burma Malaya West Indies Gold Coast Cuba Egypt Columbia Venezuela Dutch East Indies Ceylon Nigeria French West Africa			 	38 38 34 33 30 28 27 23 21 17 10 15 22 20 20 20 18 18 17 11 5 11 5 8 8

It will be seen that India comes a long way down in the list and even countries like the West Indies, Cuba and Gold Coast, etc., have a higher consumption of cloth per head of population. The low consumption of cloth in India, however, is associated with the poverty of the agriculturists, who form the bulk of the population, and unless effective measures are taken to increase their standard of living, it is difficult to envisage a large increase in the consumption of cloth in India. Thus, all these alternatives which we have briefly discussed are not easily practicable from one point of view or another. We must therefore consider in some detail the fifth alternative which is to find other uses for cotton besides the manufacture of clothing materials.

Industrial Uses for Cotton

In the minds of most people cotton is associated with the manufacture of cloths and it is true for India at least that the bulk of the cotton grown here is used for this purpose Some cotton in used in filling up mattresses cushions etc., all over the country, while in the northern parts a certain quantity is required for preparing coverlets which are used in place of blankets, but the total quantity used up in these lines is not large. In more industrialized countries however large quantities of cotton are used for numerous purposes other than the manufacture of clothing materials. To take an example, it is estimated that in the USA 40 per cent of the cotton crop is used in industries other than those connected with the manufacture of clothing materials. When we remember that the American crop averages from 12 million to 16 million bales per year we get an idea of the vast quantities of cotton, amounting to nearly 5 million bales which are consumed every year by such industries Here, then, we have a clear indication of a very promising solution of one of India's pressing problems, namely, the disposal of its surplus cottons. It is true that industrially India is far behind the USA, and, therefore, we cannot expect that at present large quantities of cotton will be diverted to such outlets of consumption as have been found useful in the USA But every year India is making some progress, however small it may be, towards the development of newer and the expansion of older industries. It is, therefore, necessary that the problem of the surplus cotton should be borne in mind at this early stage of the industrialization of the country and that suitable outlets should be found for it, because if this problem is not tackled now in a proper manner substitute raw materials, whether imported from outside or obtained in the country, would be employed instead, and it would become extremely difficult at a later stage, to replace them with cotton If, following the example of the USA, we can find new uses for just 20 per cent of our cotton crop, the problem of the surplus cotton will have been solved to a large extent

We may at this stage consider some of the uses to which cotton can be put besides the manufacture of clothing materials. These are numerous, as will be seen from the following list which is by no means exhaustive —

Road making
Bagging for cotton bales
Sugar bagging
Pneumatic tyres
Motor car accessories
Aviation and aeroplanes
Sheep coats
Wrappings for meat
Absorbent cotton
Machinery bearings
Imitation leather trunks
Canvas for shoes
Canvas boats
Hosiery goods
Houses and other structures
Cheap carpets

Typewriter ribbons
Fishing nets
Linoleum and oilcloth
Cotton belts and belting
Pyroxylin-coated fabrics
Golf club shafts
Tobacco plant coverings
Covering for dried fruits in curing process
Lining for canals and ditches
Valves for oil valve drilling
equipment
Housing material for electric
vibrators
Cotton bags for cement
Rubber-proofed garments

It will be noticed that the list covers a wide range of uses from the half-inch typewriter ribbon to the 90-inch wide fabrics required in the construction of roads from the small bearings for the machine shafts to the bulky bundles of absorbent cotton. The quantities required for the purposes enumerated above would vary naturally from one item to another. Some would be satisfied with small quantities while others are capable of consuming fairly large quantities. Take for instance, the motor car industry. It is estimated that about 90 lbs of cotton are required in the manufacture of each motor car. When we remember that in 1936 over 24 million (Continued on p. 267)

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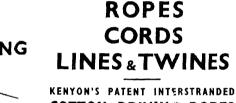
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CHEMICAL RESEARCH IN THE TEXTILE INDUSTRY

By

K. VENKATARAMAN, D.Sc. (Manc.), F.I.C., A.M.I.Chem.E.

Head of the Department of Chemical Technology, University of Bombay

THE chemist has played a notable part in the development of the textile industry and it may be of interest to the readers of the Indian Textile Journal to survey some of the achievements of the textile chemist during the 50 years of the life of this Journal. There is, perhaps, no branch of chemical technology in which there has been such progress in this period as in the applications of chemistry to the textile industry. While academic chemists working in university laboratories have been responsible for many discoveries in textile chemistry, it is a remarkable fact, whose significance must be brought to the notice of those in authority in our textile industry, that the great advances in the chemical processing of textiles, of which a brief account is given in the sequel, have been possible mainly on account of research conducted and subsidized by the industry itself. Organizations such as the I G. Farbenindustrie, the Imperial Chemical Industries, du Pont and the Tootal Broadhurst Lee Co, have long been aware of the necessity for continuous and intensive research, and they have 10% only organized research on a large scale und r their direct auspices and for their own immediate purposes, but have also actively encouraged, by substantial subsidies, the pursuit of fundamental investigations with no obvious practical value. The phenomenal development of the chemistry of dyes has been due to the stimulus of the dyestuff industry, and the growth of aromatic chemistry in general, on which has depended, for instance, the progress made in organic medicinal chemicals, has been influenced by the synthetic dyestuff industry.

Cellulose

The elucidation of the structure of cellulose and of the constituents of wool and silk has given the textile processer a knowledge of the nature of his raw materials, which has enabled him to attain a closer approach to his ideal of producing a desired result in feel and appearance without prejudice to fibre strength. Cellulose has been shown by Haworth to be built up of a recurring complex of cellobiose molecules, which in turn are built up from beta-glucose by 1:4—anhydride linkages. The size of the cellulose macromolecule is still a moot point, as the end-group methods of Haworth and of Neale and the physical measurements (such as osmotic pressure of cellulose acetate solutions, Svedberg's sedimentation equilibria and Staudinger's limiting viscosity) have yielded conflicting results. The X-ray studies of Mark and Meyer have led to a picture of the structure of the cotton fibre in which the chain molecules of glucopyranose units are united end to end by primary valencies, and bundles of such main valency chains are held together laterally by residual forces, each such bundle constituting a micelle. This idea of cellulose structure has its limitations, and a much more complex three-dimensional network, involving both an orderly micellar structure and enveloping amorphous regions, has been suggested as being more in accordance with recent studies on natural and regenerated cellulose. The dual conception of the chain molecules and their micellar arrangement has been valuable, however, in interpreting the reactions of cellulose and modifications in its properties as "degradation" and "activation," and in regulating dyeing and other processes for cotton and regenerated cellulose in the light of this hypothesis. The chain molecule hypothesis gives us an insight into the mechanism of the degradation of cellulose and into the nature of "hydrocellulose" and "oxycellulose." From the point of view of the processer one important result of the labours of the cellulose chemist has been that methods have been devised and to some extent standardized for the assay of cellulose quality. While cellulose cannot be estimated directly like simpler organic compounds which take part in reactions in stoichiometric proportions, and its purity cannot be examined in terms of readily determinable physical properties, such as melting point, refractive index, etc., we are now aware that cellulose has a number of measurable characters Of these, the two which are most widely used are the reducing power in terms of the copper number and the size of the chain molecule in terms of the viscosity in cuprammonium solution. Estimation of the non-cellulosic constituents, such as moisture, inorganic salts, oils, fats and waxes, nitrogenous material, etc., is another approach to the problem. Briefly, the quality or purity of a given sample of cellulose, i.e., the extent to which it deviates from chemically pure or "standard" cellulose, can be gauged by detecting and estimating any degradation of the cellulose on the one hand and, on the other, by quantitatively assaying the non-cellulosic substances which may be present.

From our knowledge of the chemical constitution of cellulose as composed of a chain of cellobiose units, it is apparent that cellulose is by no means an inert or non-reactive substance. In contrast to its stability to alkali and to reducing agents, cellulose is known to be sensitive to the action of acids and oxidizing agents. This is a consequence of its polysaccharide structure and, further, many phenomena concerning the chemical behaviour of cellulose are completely explicable on the basis of its derivation from beta-glucopyranose. The hydroxyl groups in cellulose provide us with highly reactive centres, which can be utilized for the practical purposes of modifying the properties of cotton or rayon in various ways. Etherification and esterification are two modes for such attack. By the use of complex etherifying and esterifying reagents, the constitution may be so altered as to impart entirely new reactivities and properties to the original carbohydrate.

Since protein character, in so far as the possession of free and potential amino and carboxyl groups is concerned, can be imparted to the cellulose molecule, the gulf between the cellulosic (or vegetable) and

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protein (or animal) fibres has been bridged, and the broad classification of the future would be between natural and synthetic fibres, as in the case of dyes

Chemistry of Wool

The chemistry of wool is much more complicated than that of cellulose. It consists essentially of long peptide chains, bridged across by disulphide, salt, and, perhaps, other linkages. By the fission of wool keratin we obtain a large number of amino acids of varied complexity, and the precise manner of their union in the keratin molecule would be next to impossible to determine. We have, however, adequate data already for understanding the response of the wool fibre to the physical and chemical treatments to which it may be submitted Apart from the considerations that arise out of the presence of amino, carboxyl, and amide groups, it has been shown by Speakman that it is the disulphide linkage which constitutes the reactive or labile part of the keratin molecule and needs, therefore, to be borne in mind in regard to the behaviour of wool during the processes of scouring, bleaching, milling and dyeing In the lubrication of wool and in scouring and dry cleaning, there have been numerous improvements made Chemical methods are available for controlling milling, i.e, increasing or decreasing the felting power of wool. Chlorination of wool leads to reduction in shrinkage, and an improved process due to Hall is to use sulphuryl chloride in white spirit.

The four main types of artificial silk—nitrocellulose, viscose, cuprammonium and acetate silk—are well known. A later development was staple fibre consisting of short cut-up filaments of rayon; these can be mixed with cotton or wool and spun on the normal cotton and wool machinery For this reason staple fibre has much better weaving qualities than the filament art silk, and it is being increasingly used , it is the main form in which regenerated cellulose will ultimately survive as a textile. Staple fibre derived from viscose or cellulose acetate can also be modified in its properties to resemble wool; this is possible not only in regard to dyeing properties, but also to feel, crimp and the characteristic scaly appearance A product which is more correctly called an artificial silk or wool than the rayons, which are regenerated celluloses, is Lanital or casein wool, which has been produced in Italy for some years; but the synthetic fibre par excellence is the silk substitute, Nylon, being a product of ultimate synthesis; it is a polymeride obtained by condensing an aliphatic dibasic acid with an aliphatic diamine, and these in turn can be synthesised from the elements. Being a polyamide, Nylon is closely allied in its chemical structure to silk and wool, its dyeing properties being therefore similar. Physically it is a strong silk-like fibre with great possibilities as a textile. Many variations in the conditions of the synthesis and in the properties of the resultant material are feasible, so that its utility is not limited to textiles.

Synthetic Dyes

The synthetic dye industry has undergone revolutionary changes during the half century that has elapsed since the foundation of this *Journal*. In 1890, vegetable dyes were still largely employed, in spite of their many limitations in regard to the narrow range of shades available, the inferior fastness with rare exceptions, the difficulties in obtaining the dyes in standardized form, and the tediousness of the processes involved. The only synthetic dyes produced commercially were a fairly extensive series of basic colours, a few azo

dyes and alizarine. Two other notable discoveries made earlier were Para Red, the first "ingrain colour," in 1880, and Congo Red, the first direct cotton colour in 1884. The first sulphur black was made in 1893 and at the same time it was realized that the method of thionation or heating aromatic amines with sulphur was widely applicable and resulted in a series of inexpensive and useful dyes. Although a laboratory synthesis of indigo had been achieved by Baeyer as early as 1880, it was only in 1897 that the Badische Anilin und Soda Fabrik succeeded in effecting the first commercial synthesis.

The beginning of the twentieth century is regarded as a landmark in the dyestuff, as well as the textile industry, on account of the discovery, in 1901, of Indanthrene Blue by Bohn, as a result of which the dyer has now at his disposal dyes of a degree of fastness not only hitherto unsurpassed, but representing in many cases a permanence greater than that of the fibres themselves. During the 40 years that have elapsed since Bohn's classical experiment, a whole series of anthraquinonoid vat colours, representing a full range of shades including greens, have been added to the armoury of the dyer and printer by the ingenuity of the organic chemist. Some of the outstanding representatives are: Indanthrene Yellow G (1901), Golden Orange G (1905), Dark Blue BO (1905), Black BB (1906), Red 5GK (1909), Brown R (1910), Khaki GG (1911), Brilliant Violets (1908), Caledon Jade Green (1920), Indanthrene Golden Yellow RK and GK (1922-24), Brilliant Orange GK and RK (1925), Direct Black RB (1928), Cibanone Red G, Caledon Ming Blue and Indanthrene Turquoise Blue

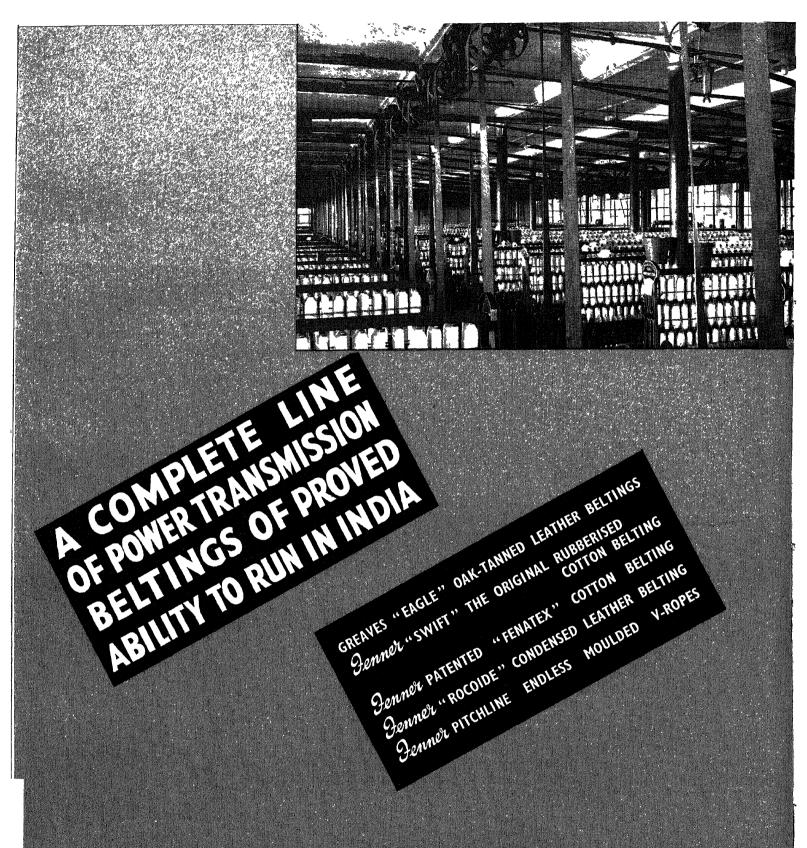
The chemically simple process of halogenation has proved of great value in improving the brightness, purity of tone and fastness of vat colours, both of the indigoid and anthraquinone class, the technical utility being on account of special methods of halogenation which have been devised Ciba Blue 2B (tetrabromindigo), Ciba Heliotrope B, Durindone Red R, Indanthrene Blue GCD and BCS, Indanthrene Yellow R, Indanthrene Orange 4R and Indanthrene Red-Violet RRK are examples

With the preparation of the first Indigosol in 1921, vat dyes became available in a water soluble form, so that the stage of vatting could be eliminated. Hydrolysis and oxidation are, however, necessary for development, and for other reasons, of which the cost is one, they are still of much more limited use than the parent vat colours in cotton dyeing. In calico printing, they are invaluable, as they provide us with the only convenient method by which vat reserves under a vat ground can be obtained.

A major achievement in connection with the preparation of dyes by sulphurization or thionation is Hydron Blue (1909) Thirty years after its first preparation, it is still widely used as a substitute for indigo and the indanthrene blues, and the shortage in supplies of this dye is one of the many problems facing the dyer in the present situation. The Society of Chemical Industry, Basle, have made a special study of the production of vat dyes by sulphurization, of which Cibanone Yellow R, Cibanone Orange R, Cibanone Blue 3G and Cibanone Black B may be cited.

Naphtol AS was discovered by the Griesheim-Elektron in 1911 and, including other types of primary components, there are some 30 commercial members of the series. Many of the insoluble azo dyes thus formed on the fibre surpass the Indanthrenes in brilliancy and in economy of application; the reds have superseded the classical Turkey Red which is very much more tedious to produce. Naphtol AS and AS-G represent two distinct types of "Naphtols," the latter in fact being not (Continued on p. 213)

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J.H. FENNER&CO LTD HULL ENGLAND GREAVES COTTON & COLD FORBES ST. BOMBAY

COTTON TEXTILE PROTECTION AND THE CONSUMER

Ву

S. GANAPATI RAO, D.Litt.

HE burden on the consumer is one of the most vital effects of protection. It is reflected in the matter of consumption. This loss may be measured by the increased consumers' outlay on the goods in question plus the value of the number of units of the goods by which the amount consumed is diminished.

This can be expressed thus —

$$(p_2 q_2 - p_1 q_1) - (q_1 - q_2) p_1$$

where p_1 and q_1 are price and quantity consumed of the good before the imposition of the tariff and p_2 and q_2 the same after the tariff. The quantity of the burden can thus be measured either by q_2 (p_2-p_1) or q_1 (p_2-p_1), if, in the second expression above we take the post-duty price p_2 instead of the pre-duty price p_1

Since the burden of protection on the side of consumption is related only to the actual prices of the protected article the above seems to suggest a plausible method of assessing such burden. Upon this basis, therefore the following attempt is made to calculate the probable burden of cotton textile protection on the consumer since 1930-31. The data regarding the total quantity of cloth available for consumption and the average price per yard are drawn from the *Review of the Trade of India* and the Annual Reports of the Millowners' Association, Bombay. The following table gives a summary of the results obtained—

Burden of Cotton Textile Protection on the Consumer

Year	Total con sumption of cloth	Average Price	Price corrected to the general price level of 1929 *		(p ₂ —p ₁)	q2(b2-b1)	q ₁ (p ₂ —p ₁)
	(Crores yards)	(As per yard)				(In crores	of Rupees)
1929 30	559	3 81		(100)	0 03	0 —	
1930 31	472	3 15	3 84	(82)	0 03	0.89	1 05
1931 32	514	2 87	4 22	(68)	0 41	13 11	14 32
1932 33	601	2 77	4 26	(65)	0 45	16 83	15 72
1933 34	510	2 64	4 25	(62)	0 44	14 03	15 37
1934 35	577	2 66	4 22	(63)	0 41	14 79	14 32
1935 36	613	2 55	3 92	(65)	0 11	4 21	3 84
1936 37	575	2 48	3 81	(65)	0 0	Nil	N11
		1	Annua	al aver	age	9 12	9 23

^{*} Corrected to the general fall in prices that is for the variation in the purchasing power of money since 1929 Within brackets are the general Index Numbers of prices with base 1929 ± 100 (The figures thus represent roughly the prices as they would have been in the absence of the general fall of prices since 1929)

Thus the burden of cotton textile protection on the consumer works out to about Rs 9 2 crores per annum on an average Spread over a population of about 370 millions, it gives a burden of about 4 annas per head

per annum (It must be noted that in the year 1929, the prices of cotton piecegoods were rather low being 3 81 annas per yard. Hence this estimate of the burden may perhaps be slightly exaggerated. If on the other hand instead of taking the year 1929 as our base, we take the previous triennial average price of 3 91 annas per yard* of cloth the burden will be found to be comparatively small.)

This burden may, however be judged in relation to the value of the cotton textile production

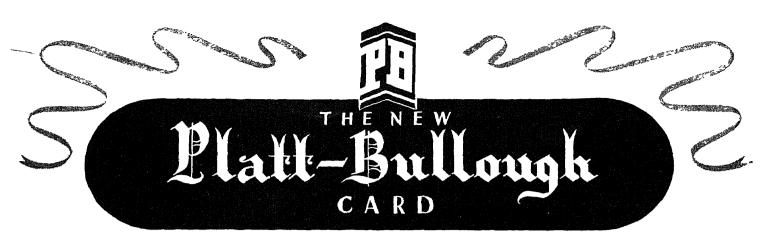
Value of Cotton Textile Production in India

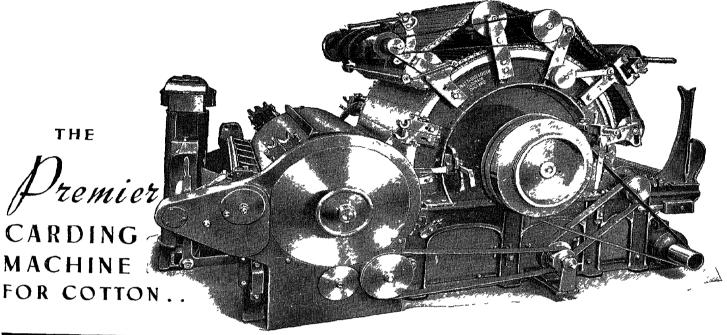
Year			Total production of piecegoods (Million yards)	Average price of cloth corrected to the general price level of 1929 (As per yard)	Value of the production (Million Rs)	
1930 31	•		3 896	3 84	935 04	
1931 32	• •	••	4 450	4 22	1 174 80	
1932-33	• •	••	4 826	4 26	1 250 71	
1933-34			4 350	4 25	1 155 58	
1934-35	••		4 823	4 22	1 272 08	
1935-36	•		5 183	3 92	1 370 08	
1936-37			5 072	3 81	1 207 77	
			Annual	average .	1 195 15	

Thus the cotton textile industry of India seems to give an average annual value to national production of roughly (119 5/9 2) nearly 13 times its incidental burden to the community Of course, all this value cannot be regarded as due to protection alone as the cotton textile industry had already been long-standing But, as has been argued elsewhere by the present writer,† in the special circumstances of India which indicate a general disequilibrium in her economy and lack of optimal employment it cannot also be supposed that this additional value due to protection must necessarily mean an almost equivalent loss in value elsewhere in national production as the critics of protection generally argue It is, on the other hand, perhaps not wrong o presume, so far as India is concerned, that the value created by protected production, is in a real sense, and to an appreciable degree, a net, additional value to national production And this net additional value seems to be, also a fair multiple of the incidental burden to the community, inevitable under the process by which that value has been created

^{*} Vide Appendix X (p 135) of the Report of the Special Tariff Board on Cotton Textile Industry, 1936.

[†] A thesis on Indian Tariff Policy" under publication.





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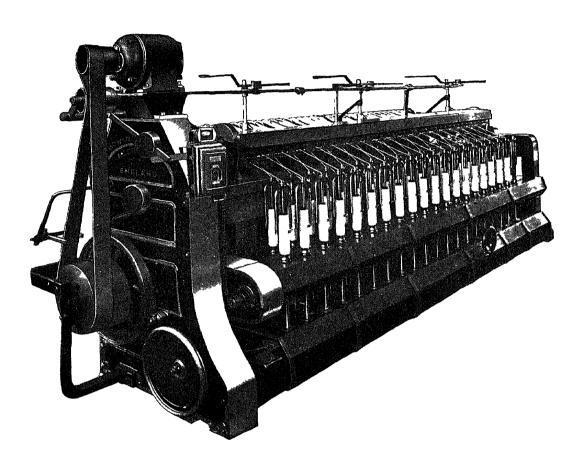
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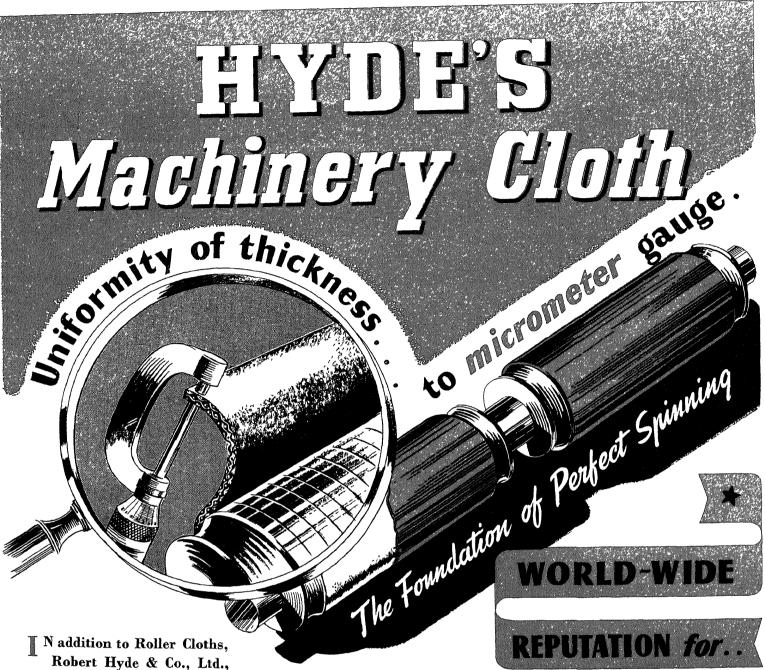


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FACTORY LEGISLATION AND TEXTILE FACTORIES IN THE PROVINCE OF BOMBAY

Βv

T. W. JOHNSTONE, O.B.E., D.I.C.

Chief Inspector of Factories, Bombay

FIFTY years are a long span in the life of a human being and in the life of a technical journal also. Although my connection with India does not cover the whole of the period dealt with in this article, the state of factory legislation at the commencement of the period is known and it is possible to write from personal knowledge of more than a half of the period covered by the "Golden Jubilee."

The first enactment to control conditions in Indian factories was passed in 1881 and was in operation at the commencement, viz., 1890, of the period covered by this note.

A "factory" was then defined as a premises using power and employing 100 persons or more for not less than four months in the year. No attempt to limit the hours of work of adult labour was made and, like most initial Factory Acts, a start was made to regulate the conditions of employment of child labour. A child was declared to be a person between the ages of 7 and 12 years and such a "robust" person was allowed to work for 9 hours a day with a rest interval of one hour and with 4 holidays a month. Children were prohibited from working in two factories on the same day and, in the absence of birth certificates, arrangements were made for their certification by certifying surgeons. On the physical protective side, children were prohibited from cleaning machinery in motion and from working between the fixed and moving parts of machinery, a provision that was necessary to prevent serious and fatal accidents on mules which were then almost generally used for spinning. The 1881 Act also required certain machinery to be fenced, granted power to Local Governments to frame rules in other cases, and also gave power to the inspectors who were appointed to administer the Act, to pass individual orders, that were subject to appeal, to secure the safeguarding of other machinery not included in the special provisions.

The above and a few supplementary provisions with respect to notices, registers, and the reporting of accidents were all the restrictions that were placed on employers who were permitted to work adult labour without any restrictions.

Severe criticisms of the initial Act on the grounds that it afforded inadequate protection to children and failed to regulate the employment of women led to the appointment of Commissioners and to the Amendments of 1891. These came into effect shortly after the *Indian Textile Journal* was started.

The number of persons required to constitute a "factory" was reduced from 100 to 50, whilst the Local Government was granted power to fix it at 20. The lower age of a child was raised from 7 to 9 years and the upper age from 12 to 14 years. A compulsory stoppage of work for half an hour except in shift-working factories was introduced, and women, save those employed in seasonal factories, were prohibited from work at night. They were not allowed to work for more than 11 hours

a day with adequate rest intervals. The night employment of children was prohibited and their hours of work were reduced to 7 per day and, probably as in Britain several decades earlier, attempts to defeat the law were countered by the provision of a penalty for the use of a false certificate.

The rule-making powers of the Local Government were extended to include the provision of drinking water, sanitary arrangements, ventilation, and the prevention of overcrowding, whilst rules were also framed to provide for the submission of returns. No attempt to fix the hours of employment of men was made and a number of textile factories started work at dawn and finished at dusk.

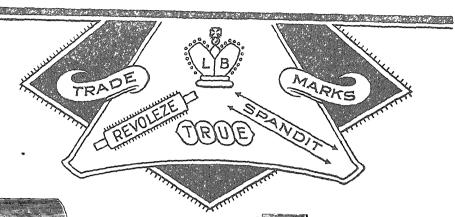
Factory Labour Commission

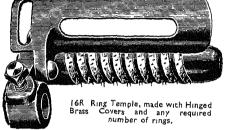
Such were the conditions throughout the nineties, through the plague period when labour was so scarce that it was auctioned on street corners, when the power of the jobber was at its height and when little regard was paid to human needs. The situation was aggravated by the introduction of electricity for lighting purposes and the boom period of 1904-05. Agitation for more humane conditions was fairly widespread and a statutory limitation of the hours of work of male adults was strongly urged. The agitation resulted in the appointment of the Factory Labour Commission which reported in 1907 whilst a new Act was passed in 1911 and was brought into operation in 1912. Some far-reaching changes were effected. The loophole in the previous law whereby numerous seasonal factories could escape all control by working a day or so less than four months was closed, and advances in the health and safety requirements were also made.

All persons, with the exception of those on exempted work, had to receive a simultaneous rest interval of at least half an hour after not more than six hours' work, whilst children and women were not allowed to work for more than 7 or 11 hours a day respectively and, with the exception of cotton ginning and pressing factories in which women were allowed to work at night, they could not be employed before or after certain specified times. A distinction, however, was drawn between textile and other factories and a limit of 12 hours work per day was fixed for male adults in the former class whilst a limit of 6 hours a day was placed on child labour.

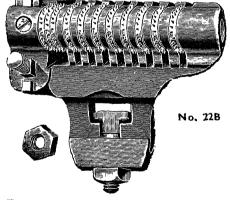
The 1911 Act was operative throughout the years of the first European war, the closing years of which and the period immediately after, were marked by a great increase of ''labour unrest.'' The importance of labour and the need for ameliorative conditions were also recognized in the Peace Treaty and the meeting of the first International Labour Conference at Washington in 1920.

Prior to the implementing of some of the recommendations of the Conference, important labour sections

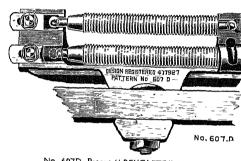




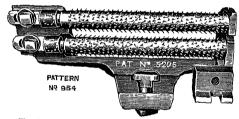




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had successfully struck for a reduction of hours but the amendments of 1922 were undoubtedly influenced by a desire on the part of the State to legislate for fairer conditions for the bulk of factory employees.

The distinction between a textile and a non-textile factory was thus abolished, a maximum 11-hour day and a 60-hour week were established for men and women alike; the rest interval was increased from a half to an hour's duration, and the night employment of women in cotton ginning and pressing factories was stopped. Several exemptions and exceptions were withdrawn and the Provincial Government was given power to apply all or any of the provisions of the Act to concerns employing more than 10 persons irrespective of whether or not power was used in aid of the manufacturing process. The number required to constitute a normal factory was reduced from 50 to 20 to be "simultaneously" employed.

Radical changes were made in the age limits of children—the lower age was raised from 9 to 12 and the upper from 14 to 15 and no child was allowed to work for more than six hours per day.

The amendments of 1922 broke new ground also. Humidification was controlled, some regulation of the ways, works and buildings was introduced, protective legislation for women and young persons on dangerous lead processes was incorporated and exemptions and exceptions were rigidly reduced and could only be given under well-defined principles. The rule-making powers of Provincial Governments were extended and the principle of an enhanced rate of pay for overtime for exempted persons who were employed in excess of the weekly maximum was incorporated in the Act.

Restrictions on the use of machinery and the control of shifts were removed.

Slight changes were made in the next decade. The most important was that of 1926 which aimed at the prevention of child labour exploitation by parents or guardians. This provision was effectively applied in one centre and, combined with improved certification, was instrumental in preventing children from being employed all day by the simple expedient of double certification.

The Royal Commission on Labour

This decade was, however, marked by the appointment of the Royal Commission on Labour. This Commission, ordinarily referred to as the Whitley Commission, visited India in 1929 and 1930 and its comprehensive survey and report has had a wide influence on labour conditions and protective legislation. The 1934 Act, which brings us to the Factories Act of the present time, bears the impress of the Commission's Report. It has recognized three classes of factories, viz., perennial factories, i.e., those which work throughout the year; continuous production factories which do not stop machinery or processes for long periods; and seasonal factories which work for a limited period each year. The weekly hours for men and women alike have been fixed at the maxima of 54, 56 and 60, respectively. Maximum limits of 10 hours in the first two categories and 11 in the last have been fixed per day, but a limit of 10 hours per day for all women has been fixed and cannot be exceeded under any circumstances. A child's hours of work cannot exceed 5 per day whilst another loophole in previous legislation has been closed so that it is now impossible to exempt any child from the weekly holiday.

The "spreadover," i.e., the working hours together with the periods of rest, was fixed for all classes of labour with the exception of workers engaged on urgent repairs or subject to special exemption, and a new category, corresponding to some extent to the young person's class in Britain, was brought under regulation whereby an adolescent, i.e., a person between the ages of 15 and 17, may only work the hours fixed for an adult if certified fit to do so. A further loophole was closed by the deletion of the word "simultaneously" from the definition of a "factory" to prevent those concerns that employed more than 20 persons at different times of the day from escaping from regulation.

Noteworthy changes were made in other directions, particularly those concerned with welfare, the provision of first aid, rest shelters, rooms for children, the improvement of working conditions based on the cooling power of the workrooms, the control of hazardous occupations that involve special risks from injury, poisoning, or disease, whilst the provisions affecting health and safety were re-enacted and extended.

The above read in conjunction with the other articles of this Golden Jubilee issue will conclusively prove that with the technical development of the textile industry, factory legislation has also advanced.

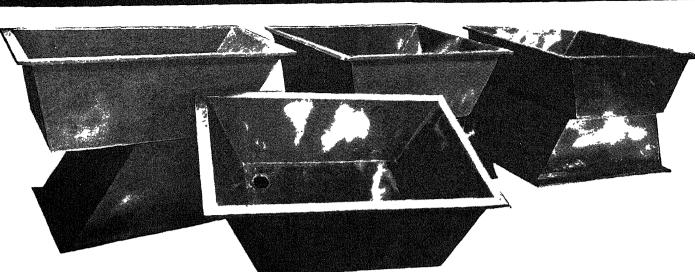
But before passing on to a review of the improvements in the industry, mention should be made of the Workmen's Compensation Act, enacted in 1923, which has established the right of compensation in the event of an accident arising out of or in the course of employment; to the Bombay Maternity Benefit Act, a local measure that was introduced to regulate the employment of women before and after childbirth and to secure the payment of a benefit by the employer; to the Bombay Industrial Disputes Act to regulate industrial relations between employer and employee, and to the Payment of Wages Act. The latter Act ensures the prompt payment of wages, controls all deductions from them, and governs the fining system. All the above enactments have effected very considerable changes and a worker is protected by the State in several ways and possesses very material rights and privileges.

Improvements in Textile Factories

The period covered by the Jubilee has seen very many changes in the ideas underlying the construction of textile factories. The former lofty-storied mill is no longer built and whilst during the first portion of the period modern ideas of construction had not established themselves in Bombay and during the latter portion there has been a decline in the local industry, mill buildings in other centres, particularly in Ahmedabad, are of the single-storied type with adequate spacing of machinery, with air-conditioning ducts built in before construction, and with good natural and artificial lighting.

The modern type of textile factory enables work to be done under far better conditions than those that prevailed some years ago.

One great improvement is the attitude of the industry to child labour. One has only to read the past reports of the Factory Department to find the great difficulties that formerly prevailed. Child labour was exploited by parents, jobbers, often by those in higher positions, and occasionally by those in ultimate control. The changes in the Act of 1922 were followed by the practical abolition of child labour in Bombay whilst rigid inspection and certification and the use of the provisions whereby parents and guardians could be



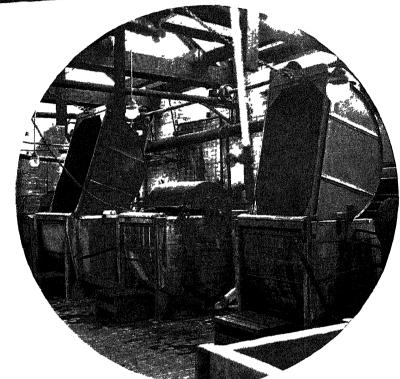
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IT'S SAFER TO BE AT WORK!

By

A. S. TROLLIP, C.I.E., J.P.

Hon. Joint General Secretary, The Safety First Association of India

POR centuries, industrialists believed that accidents in industry were unavoidable. If a man was killed in a factory accident it was looked upon as inevitable. With thousands of employees engaged in a large organization, was it unlikely that a fatal accident should occur now and again?

But with the passage of time and the progress of industry, people in this country began to realize the seriousness of the loss that accidents caused to industry as a whole. The first Indian Factories Act was passed in 1881 and the first Indian Workmen's Compensation Act in 1923.

Industrial magnates and factory executives were quick to grasp the truth of the saying, "Safety pays handsome dividends," and safety committees guided by safety engineers and inspectors soon played their part in reducing accidents in factories and workshops

Facing a New Problem

The safety problem in industry has to some extent been solved through the combined efforts of employee and employer; the former has striven to fight carelessness while the latter has provided better and safer working conditions. But industry is now faced with another problem. A man may work safely and be protected against accidents as long as he is under the direct supervision of his foreman, but that does not solve the problem of after-work accidents.

Accidents to workers, whether they occur in the factory, on the road or in the home, have the same effect on industrial output: they handicap production by depriving industry of skilled workmen. Management, therefore, takes as much interest in the safety of workmen before and after working hours as during work-time.

Accident statistics show that workmen, as a group, are much safer at work than they are in their homes or on the streets. The answer to this is simple. Man is a creature of habit; some habits are good, some not so good, and some definitely bad. Chief among the good habits is the safety habit and one of the worst among the bad, the unsafe habit that is the outcome of carelessness or recklessness. It is popularly believed that a person trained in occupational safety is safety-conscious before and after work as well. This is not so. It often happens that a man who is a most excellent safe worker when on the job loses sight of the safety habit when he leaves the plant.

There is the case of the safety engineer who did his utmost to make the plant a safe place for his fellow employees but thought there was nothing wrong in bragging that he did a week-end trip with an average speed of 60 miles per hour for a total distance of 150 miles. He risked his life, the lives of those in his car, and of unknown individuals using the same highway. Why? Because he had not learned that Safety is a twenty-four hour job.

How It Is Done

Since employers have no right to control the activities of their employees before or after working hours,

It is essential that the whole safety programme has to be free from even the slightest taint of compulsion or force. The nature of the programme should be positive rather than negative, and should strive to stimulate pride in safe habits in the home and on the street. Safe driving should be looked upon as an accomplishment in sportsmanship, and a safe home the natural result of efficient housekeeping

In carrying out a programme to prevent before-and after-work accidents, the employer can do nothing better than interest the employee's wife and children in the work. The instinct of self-preservation is a potent factor in the success of a safety programme; but a mother's instinct of sheltering and protecting the off-spring makes her an excellent medium for the successful working of such a scheme. Management would do well to interest the wives of employees in the safety of their husbands; as bread-winners of the family it is important that nothing should happen to them before, during or after working hours, which would prevent them from carrying out their daily duties and earning a livelihood to the best advantage

The Place of the Foreman

Since the foremen occupy an important position in industrial organizations, it should be brought to their notice that as keymen in the plant they are responsible for the safety and general welfare of their men. The successful foreman is the one who says to his men, "How can I help you fellows to make life safe and your earnings secure?" Not for a moment does he give them the feeling that looking after their safety outside the plant is part of his job. Rather, he gives them clearly to understand that their safety is their own responsibility, though he is prepared to give them every assistance he can to secure it. He urges them to have recourse to self-help rather than depend on management to look after their safety, and argues: "If you and I don't prevent accidents on our own jobs, who will?"

To begin with, the foreman asks his men to cooperate with him in forming a programme for a safety campaign. He asks each man in the department to send in some suggestions. He puts all the suggestions together. These in turn are combined with suggestions from other departments and a complete programme is formulated. The men now feel that the campaign is their own and are ready to give wholehearted co-operation.

Carrying it Through

Making a programme is the easiest part of a safety campaign; carrying it through is the test of sincerity and efficiency on the part of management. Establishing a safety committee is not enough. Those at the helm of affairs must see to it that the entire programme is faithfully worked out to the minutest detail. It often happens that the head of an industrial organization while on a tour abroad is convinced of the good work done by safety organizations in foreign industrial plants. He determines to start safety activities in his own organization and gets one of the executives interested in the subject. A grand inaugural ceremony takes place and (Continued on p. 95)

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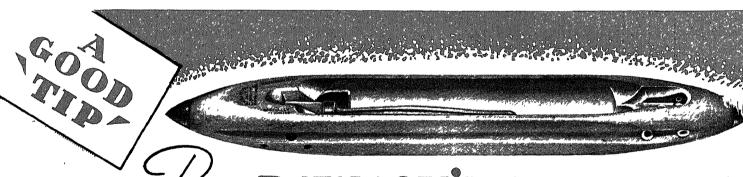


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ADULT EDUCATION AND THE TEXTILE INDUSTRY

By R. D. CHOKSI, M.A.

It is fitting that the Golden Jubilee Souvenir of the Indian Textile Journal should neglect no aspect of life that is related to the textile industry; and, accordingly, the as yet very limited field of adult education among mill-workers rightly finds a small place in this number.

Adult education in India is in its infancy and, in the opinion of many, industrial labour is a promising field for the early and rapid extension of adult literacy. While industrial organizations are aware of this and several leading textile concerns have for some time past given attention to the educational needs of their employees, the sum total of all kinds of adult education work among the workers is as yet negligible, both in respect of the numbers reached and the expenditure. It is customary to lay the whole blame on the employer, but in a sense we are all jointly responsible. What steps have educationists, for instance, or educational institutions taken in the past to rid the country of illiteracy? What pressure has the State brought to bear in this matter? The responsibility lies with employers, workers' organizations, educationists, the State and society. But there is little satisfaction in apportioning the blame; and, in accordance with the aims of this Journal, our purpose here is to help on the good work by making known what has been done and by indicating lines of advance.

Lack of Enthusiasm

In an endeavour to ascertain accurately what has been done in the field of adult education, the Editor of this Journal sent out a circular to all leading textile organizations, seeking information on every aspect of adult education activity undertaken by the mills. The response has shown how limited is the work being done.* Some wrote to say that nothing was being done; others did not reply-probably because there was nothing to report. Other replies showed that where adult education work was undertaken it was a small part of the welfare work of the organization. It was also evident that the organizations that were first alive to the need of welfare work were first in the field of adult education, and pride of place goes to the Buckingham and Carnatic Mills of Madras. Elsewhere in this number the reader will find a very able survey of industrial welfare work. That adult education work should be subordinate to it is inevitable in the scheme of things, for textile concerns have other larger responsibilities to assume than that of adult education. The doctrine "I am my brother's keeper" is as yet imperfectly understood, and it is hardly fair to expect that industrial organizations should realize it in advance of the greater part of mankind. This article is in no sense intended as a criticism of organizations that have not yet entered the field of adult education, still less is it critical of the slender efforts of organizations that have responded to the circular.

Individual mention of the work of each organization is hardly possible here; and if one or two are named it is but to illustrate the kinds of work being done. Not only does priority in time belong to the Buckingham and Carnatic Mills, but it is the only instance in which work is being done on a scale commensurate with the size, resources and importance of the organization. This is shown by the following facts.—

- (1) 80 per cent. of the workpeople are literate.
- (2) Provision for the education of adult girls and women
 - (3) Supplementary classes for technical education.
 - (4) The provision of reading rooms and libraries.
 - (5) Extensive recreation facilities.
- (6) The mills' school considered as an integral part of the industry's organization.
- (7) An expenditure of Rs. 76,000 on the running of the schools.

There are other organizations that are doing interesting work, especially on the side of recreation facilities and in providing amenities such as reading rooms, club rooms and dramatic entertainments Several of them run night schools and literary classes. In Bombay some mills send workers to the Textile Technical School of the Social Service League. One or two have their own technical training classes for young adults. In most of these organizations the number of workers reached in actual class work is small; in a few only do the numbers exceed 100. It is not possible to estimate the number of workers that benefit through recreational activities; but, if one's own experience may be taken as a guide, it does not seem that large numbers regularly take advantage of the facilities offered; and it may be added, not unfairly, that in some organizations recreational activities are fitful and there is no regular agency for a systematic and proper conduct of such activities.

Other Agencies

This description leaves out of account the service rendered to working people by Government centres and social reform institutions of different kinds Our proper subject here is the work directly undertaken or sponsored by textile organizations themselves. A sign of the times is the increased co-operation between outside agencies and mill managements. Such cooperation needs to become "wholesale"—if a commercial term may be used. There should be the right kind of social organization to undertake the work, while the mills supply readily the sinews of war for a campaign against darkness and ignorance If literacy work, for instance, is to be done on a comprehensive scale it is unlikely that a business concern will itself undertake the work and provide the requisite educational experience. Conditions will indeed differ in different areas, but a word on the present position in Bombay may indicate a possible line of advance for other cities. After a very successful city-wide literacy compaign in May 1939, conducted by the Social Service League, the then Government of Bombay seized the opportunity and appointed an Adult Education Committee for the city. This is now the central organization for adult education

^{*} Grateful acknowledgment is due to the Century Spinning and Manufacturing Co, Ltd (Century Mills), Killick Nixon & Co (Kohinoor Mills) and the Khatau Makanji Spinning and Weaving Co, Ltd (Khatau Makanji Mills), all of Bombav, Rohit Mills Ltd. of Ahmedabad, Buckingham and Carnatic Co, Ltd., of Madras, Mohini Mills Ltd. (No 1) of Nadia, and the British India Corporation Ltd. (Cawinpore Woollen Mills, Cawinpore Cotton Mills and New Egerton Woollen Mills) and Begg, Sutherland & Co, Ltd. (Elgin Mills Co, Ltd., and Cawinpore Textiles, Ltd.), both of Cawinpore

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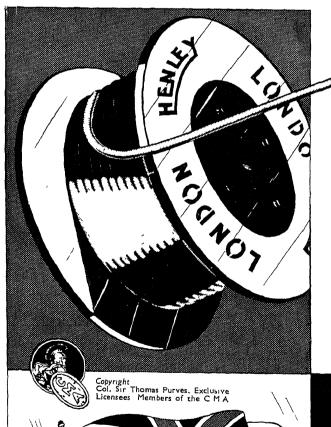
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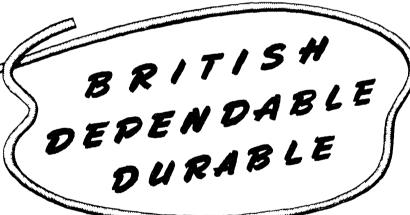
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work and has as literacy officer an experienced member of the Educational Service. Several textile mills are now co-operating and have entrusted their adult education work to this committee. The mills are responsible for finance and afford class-room space where possible, the committee does the rest. We cannot expect miracles; but if every mill followed suit, the nucleus of a comprehensive adult education scheme for textile workers would come into being. Beside mill managements and the Education authority, there is an obvious third party without whom nothing substantial can be done-workers' organizations. The Manshardt Committee on Adult Education (appointed by the Bombay Government in February 1938) says in its report. "The committee would suggest that the adult education of workers can in many industries be undertaken by organizations of workers themselves. Instead of regarding organizations of workers as potential menaces, it should be recognized that a strong labour movement is an asset to industry, and that the social effectiveness of the labour movement depends upon the intelligence of its members. An adult education programme for workers which starts at the heart of the working experience and is related definitely to the interests of workers, is certain to command their attention and continuous support. Such a programme cannot be drawn up independently of labour itself " (p. 24 of the Report).

The time factor presents a problem in itself. Usually classes are held after working hours and progress is hampered by the fatigue of the day's work. Only a further reduction of the worker's day can remedy this—and that is a question outside our reckoning.

As to the nature and scope of adult education work among such workers, it is indisputable that if sound foundations are to be laid for the progressive education of the illiterate worker we must begin with literacy; and every properly conducted literacy class from its inception becomes something more than a literacy class -which nullifies the criticism that mere literacy is of no use. Experience has shown that it is false to say that adult workers are not interested, as a rule, in learning to read and write. There is, however, no denying that inertia and distrust have often to be overcome. Other forms of adult education have a value and may be carried on side by side but they must be regarded as ancillary for the present. Even as a school which did not teach its pupils to read and write and study basic subjects would be condemned, so must a scheme of adult education which excluded literacy be judged. But after literacy, what next? There is indeed no limit to the scope of adult education which by its very nature is a life-long process; and environment and the needs of employee and employer will usually determine lines of advance. Some will have a fuller primary education, others simple vocational training or technical education, yet others again will turn to the cultivation of a special interest for its own sake, and all will gain a fuller understanding of the duties and rights of citizenship.

The Question of Finance

In speaking of finance, it was taken for granted that the mills should pay. The question may well be raised, why should not the State pay and why not the employee himself. On what grounds do we mulct the employer? Many arguments have been advanced both for and against the employer. Here, only two simple points are advanced for consideration. The first, that the cost is relatively small—especially when viewed in relation to the annual financial statement of any mill. The cost of the

hrst stage—literacy—has been computed at a figure as low as Rs. 2-8 per head and the highest estimates are Rs. 5 per head | Subsequent stages of adult education work are bound to cost as little per head per annumexcept, of course, in respect of any form of technical education The second point with which this article closes—is as simple. It is the point of utility—the practical advantage of having literate and semi-educated workers -which should appeal to employers. Experience has shown that while the worker benefits, the employer benefits as much if not more; and, in a pamphlet, the Buckingham and Carnatic Mills Co., Ltd., says quite plainly and directly that the motive behind expenditure on such things is "not a desire on the part of the mills to distribute a portion of their profits in the form of charity, but a long-sighted appreciation of the school's value to the industry as a whole where intelligence is a highly rated asset." And these mills have prospered!

It's Safer to be at Work—(Concluded from p. 91)

numerous committees and sub-committees are formed. After a few weeks of unceasing activities the pace begins to slow down; the enthusiasm of the safety workers shows signs of flagging. The main reason for this is the lack of tangible results; a secondary reason, though important in itself, is the lack of interest and encouragement from the head of the organization.

Success in a safety campaign is always slow and results are necessarily tardy. Unsafe habits of long standing have to be altered while new ones have to take their place. Apathy and indifference have to be combated where safety workers are fortunate enough not to encounter direct opposition.

Essentials in a Safety Programme

Safe driving contests will not be of much value in this country as the majority of industrial workmen are not in a position to own a motor car. Lecture demonstrations on home and road safety should have first place in the safety programme. Fire safety is also important. In India, particularly, where thousands of lives are lost every year through stove tragedies, a heavy burden would certainly be lifted from the minds of workmen if they were assured that their wives knew how to use the stove safely and their children were trained to leave sigrees alone.

Road safety should be taught to the workmen first and their families next. Is it not sad to think that workmen who escape unscathed the intricate machinery of the workshop and factory often become victims of a motor vehicle on the way home after work? Employees should be taught how to use the roads safely, whether as motorists, cyclists or pedestrians. They should be encouraged to carry the safety message home to their children. Separate lecture demonstrations for the special benefit of the families of employees are certainly not out of place.

Once again we repeat: the management cannot force employees and their families to observe safe practices after working hours. But it is a part of their social responsibility, apart from being a good business practice as well, that employers do their part in a fairly interested and sincere manner to preserve employees and their families from accidents; it naturally follows that the employees and their families must co-operate whole-heartedly with the management.



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WELFARE WORK IN THE TEXTILE INDUSTRY

By

CLIFFORD MANSHARDT, A.M., D.B., Ph.D., D.D.

Director, Dorabji Tata Graduate School of Social Work, Bombay

THE historical roots of modern industrial welfare work are to be found in the humanitarian movement which took rise in England during the second-half of the eighteenth century, under the influence of the Wesleyan revival. It was Robert Owen (1771-1858), himself a prosperous factory manager, who first perceived the relationship between satisfactory working conditions and increased production. His unorthodox procedure in increasing wages, shortening hours and reducing child labour to a minimum astounded his fellow-employers, but won the loyalty and co-operation of his own employees.

Owen realized that if a worker is to be at his best it is necessary not only that he should work under satisfactory conditions, but also live under satisfactory conditions. Hence in the factory village of New Lanark he provided such amenities as decent sanitation, medical care, a savings bank and a model provision store. He interested himself in the education of children and organized night classes for adults. He provided the village with a public park, recreation facilities and a public hall.

The experiments of Owen are worthy of mention because they demonstrated in the early days of industry under unideal conditions, that attention to the amenities of working life is not incompatible with a profitable industry.

But though Owen had his followers, it was not until the end of the nineteenth century that welfare work made any marked progress in British industry. The reasons which led employers to undertake welfare work are varied and the motives undoubtedly mixed. In some instances the motive was, no doubt, humanitarian and idealistic. In others it may have been purely selfish—a means to the end of increased profits. Ranging between these two extremes are the obviously utilitarian motives: the desire for increased efficiency; the desire to attract a better type of labourers into the plant, or the desire to attract labourers to a new industrial centre—perhaps in an out-of-the-way location -by offering special inducements. With the rise of the labour movement many employers turned to welfare work as a means of keeping a step or two in advance of the demands of labour and thus preventing the spread of unionism. It is not unknown for employers to start welfare work as a means of utilizing surplus profits and thus avoiding payment of heavy taxes to Governments. But whatever the motive, the nineteenth and the first decade of the twentieth century saw a marked increase in the number of employers introducing safety and sanitary measures, improving the working and living conditions of the workers, reducing hours of work and providing for the education and recreation of both workers and their families.

Beginnings

The first cotton mill in India was organized in Bombay in 1851. The American Civil War gave an impetus to the cotton textile industry and by 1873 there

were 18 mills, employing approximately 10,000 men, women and children The first Indian Factories Act (1881) was not wholly a result of the development of a social conscience in India, but received a powerful impetus from the concern of Lancashire manufacturers over Indian competition, leading to a demand to regulate Indian labour It is not my purpose here to present a history of Indian labour legislation. I would only point out that progressive improvement has been brought about by legislation in respect to working conditions, hours of work and the employment of women and children. No less important is the legislation relating to workmen's compensation, maternity benefit and payment of wages. In some instances, welfare work on the part of advanced employers has influenced legislation; in other instances, legislation has been necessary to bring lagging employers into line. Though there is an intimate connection between welfare work and industrial legislation, my concern in this article is with that voluntary welfare work undertaken by employers over and above the demands imposed by legislation.

Industrial welfare work, as commonly understood in India to-day, refers to steps taken by management, within and without the place of work, to increase the efficiency and happiness of the labour staff. Such activities include the measures enforced by factory legislation, but go beyond legislation in providing for the health, safety and comfort of the workers. Thus welfare work is concerned with medical care, education, housing, promotion of thrift, recreation, social security—in fact with any activity or condition which will help the worker to adjust to his environment in a more satisfactory manner. In India as elsewhere, the motive for welfare work varies. In some cases the motive is frankly, "It pays"; while in other cases there is a genuine concern for the welfare of the employees as men and fellow-workers.

The amount of welfare work in India is still small when compared with the number of workers employed in industry. India being a poor country, one would not expect to find welfare work on the extensive and often lavish scale that it is practised in the West. But even welfare work of a modest nature is altogether too rare.

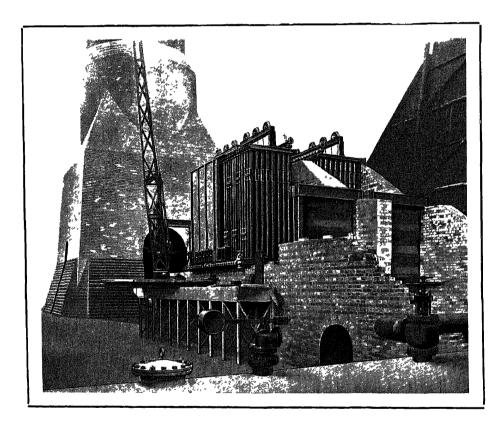
It was ten years ago that the Royal Commission on Labour in India made the following statement:

"We believe that there are great opportunities for the extension of welfare work in India, and that in few directions is expenditure of money and thought so certain to give valuable results. There are benefits of great importance which the worker is unable to secure for himself, such as decent housing, adequate sanitation, efficient medical attention and the education of his children, and an advance of State activity should be looked for in these directions. There is a difficulty in that the industrial workers form only a small fraction of the population and it is difficult to justify any elaborate and expensive extension of State services for their exclusive benefit. In present circumstances, therefore, further advance must depend to a considerable extent

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on the co-operation of employers with other sections of the community It is precisely the fact that the workers have been brought together in an industrial area which creates many of the problems of health housing recreation etc, with which they are faced For this reason we are strongly in favour, at the present juncture, of a more general extension on the part of the employer of welfare work in its broader sense. It is advisable to remember that there is a danger in giving to welfare what should go in wages and so depriving the worker of independence and of the educative experience which comes from having a margin after necessities have been met But ordinarily there is no question of choosing between raising wages and developing welfare activities Employers who have done most in the way of welfare work do not usually pay lower wages than their neighbours. Indeed, welfare work is generally associated with wages higher than are paid in corresponding establishments where no such work is attempted Extensive welfare schemes may be regarded as a wise investment which should and usually does bring in a profitable return in the form of greater efficiency '' (pages 259-260)

The extension of industrial welfare work to which the Royal Commission on Labour looked forward has not materialized. As a matter of fact, there is reason to believe that relative to the increase in the number of workers, the situation has deteriorated during the past ten years The welfare work examined by the Commission was in large measure an inheritance of the general prosperity of the early 1920's, and in part the result of feverish activity on the part of a number of employers to have something tangible to exhibit to the Commission -even though the forced plant died a natural death once the sunlight of Commission inspection was removed Again, the condition of the textile industry during the last decade has not been such as to encourage the employers to make large expenditures for welfare work Difficulty has been experienced in maintaining the status quo

Well-known Examples

It is obviously impossible in an article of this nature to give a detailed account of all the welfare activities being carried on in the Indian textile industry. It is, therefore, perhaps invidious to single out even a half-dozen pieces of work for special mention. But the illustrations cited do give some indication both of the type of work that is being done, and of what can be attempted in the welfare field.

One of the best, as well as one of the oldest pieces of welfare work, is that sponsored by the Buckingham and Carnatic Mills in Madras The activities carried on cover a wide field, including health propaganda and medical care, athletics, workmen's stores, co-operative societies safety first education, low rent worker's housing library, dramatic society and forum The educational programme includes a school for the education of half-timers, training for apprentices and night classes for those workers who wish to pursue their studies further. The welfare committee of the mills composed of representatives of management and workers deals with such questions as provident fund and gratuity workers' pensions wage increments fines bonuses and leave and medical certificates The work is under the supervision of a full-time secretary and his staff and the programme changes from time to time to meet the changing needs of the workers A

succession of annual reports dating back to 1922, indicate clearly that the welfare committee has been an important factor in promoting peace and harmony in the mills and enriching the life of the workers

The Empress Mills in Nagpur also have a long record of achievement The welfare work consists of two types—internal and external The internal work is under the direction of the management and includes such activities as cheap grain sales medical assistance creches for infants instruction for half-day girl and boy workers, noon-time recreational activities cinema shows and entertainments The external work is entrusted to the Y M C A and is carried on in the bastis' or residential areas of the workers. The programme includes kindergarten and primary schools adult classes illustrated lectures mothers' classes, institutes for games and reading purposes co-operative societies medical activities, scouting and outdoor games The model housing programme of the mills, in which the company has granted special facilities to workers for the erection of their own private dwellings, has attracted wide attention

In Cawnpore, Messrs Begg Sutherland and Co Ltd employ a welfare superintendent to direct the welfare activities of the various companies under their agency. The work follows the general pattern of schools library and reading room indoor and outdoor games, scouting, adult education medical work and entertainment. A number of workers' houses are provided at low rents. The welfare superintendent hears the workers' grievances and brings them to the attention of the proper authorities. He also deals with cases involving accidents and accident compensation.

The Delhi Cloth Mills support a welfare programme which includes recreational activities, health hygiene and safety measures, educational and vocational training schemes, workers' housing and miscellaneous benefits to workers, such as provident fund, sickness insurance scheme and old age pensions. A gymnasium swimming pool and theatre are the outstanding attractions in the recreational programme. A maternity home, child welfare centre, creche and hospital are important elements in the health programme. A labour officer engages staff, looks into complaints and supervises welfare work.

Ahmedabad is unique in that the lead for welfare work is given not by the employers, but by a labour union—the Textile Labour Association Under intelligent leadership this union has developed a strong programme and enrolled a membership of some 25,000 workers. The activities of the Association include workers' housing, medical care, schools for children of workers and adult education. The union has been an important factor in preserving industrial peace in Ahmedabad. Ahmedabad is one of the few centres in India where the workers are taking the lead in helping themselves.

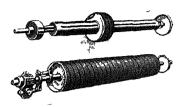
In Bombay

In Bombay a number of mills are carrying on welfare work that is worthy of mention. These mills include the Sassoon Group Century Svadeshi Khatau Makanji, Kohinoor, Morarji Goculdas, Simplex Spring and Hindustan.

The Bombay welfare work is comprehensive in scope A number of the mills provide literacy education opportunities for their workers. A few maintain primary schools while over a dozen mills send promising workers for further training in the special technical (Continued on p. 247)

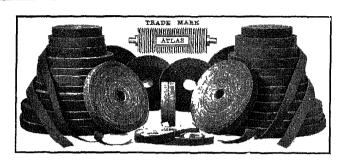
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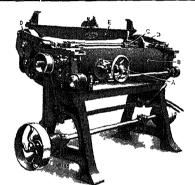
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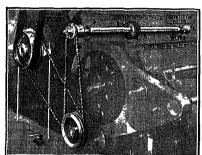
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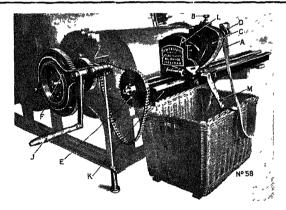
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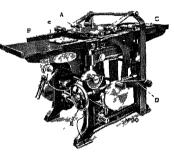
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THE TEXTILE WORKER'S HEALTH AND THE PROBLEM OF MEDICAL AID

Ву

Dr. N. H. VAKEEL, M.R.C.S., L.R.C.P.

 ${
m B}^{
m OMBAY}$, big and beautiful, may be for various reasons an admirable city for the textile industry to flourish in, but it certainly is not a haven of health and happiness for the textile worker to work in. I have seen the strong and sturdy Bhaya and the powerful Pathan of the north, with physical conditions of undoubted excellence on their arrival in this city, get broken in health after a few months' stay here as a result of fevers and other maladies of which they knew nothing in their home countries. When we are, therefore, considering the health of the textile worker of 25 years ago or to-day, let us not overlook the important part that climatic conditions and diseases, engendered partly by civic ignorance of hygiene and partly by negligence of Municipal responsibility, play in the physical well-being of the industrial worker. These conditions are at their worst in the months between July and January during which, as you will see from the statistics furnished below of one large textile mill in Bombay (Table I—the Simplex Mills Ltd., Bombay), epidemics of fevers start and reach their high-level mark about the end of the year to subside again in February until the end of June about when the number of fevers registers a low figure (vide Table I).

Year after year for the last 25 years I have watched their misery with sympathy and have wondered as to how and when the one institution in Bombay will ever awake to realize the duty entrusted to it by ratepayers—an institution, whose negligence in tackling the malarial problem of this city has been highly culpable And things instead of getting better are getting worse. Instead of corporators thinking all the time of the health problem of the city they are nowadays thinking only of elections and nominations, Hindi and Urdu language controversies, touchability and untouchability, prohibition and toddy-in short, anything and everything except health problems is levying a tax on their energy; instead their hearts and souls and sinews should be engaged in attacking the health problems of this city to the exclusion of everything else. All efforts are half-hearted, ignominiously few and far between and never sufficient even to touch the fringe of the malarial problem. In the meantime people must shiver and people must die in their thousands or be crippled in health, open drains must remain, filthy buffalo stables must defile the city's name, swamps and open gutters and irregular large tracts of lands must deface the surface of the town and its suburbs, remain-

TABLE I.

Showing the systematic rise of Malarial Fever every year during certain months from July to January in Bombay 1939 was the worst year.

(Simplex Mills records)

	1	929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	Totals for different months of the years
February March April May June July August September October November		415 83 197 349 244 247 322 397 414 468 364 290	218 210 143 158 177 153 172 53 235 247 370 254	167 161 165 149 168 174 131 57 277 409 290 264	248 200 185 221 167 192 181 242 196 217 281 229	200 184 173 101 55 202 227 194 255 279 227	207 193 198 119 266 333 362 566 484 326	230 214 223 203 193 209 218 243 241 377 273 229	186 164 158 158 189 186 196 230 435 255	252 210 216 255 234 224 248 285 236 260 229 209	212 206 172 204 152 179 238 231 253 314 249 242	223 169 180 183 196 181 299 637 793 697 417 220	2,558 1,996 2,006 2,100 1,720 1,802 2,463 2,901 3,431 4,245 3,491 2,741
Annual Totals .		3,790	2,390	2,412	2,559	2,097	3,054	2,853	2,594	2,858	2,652	4,195	

Malaria

It will be clearly seen that last year, not only was there an unprecedented prolongation of the malarial fever epidemic, but the epidemic was of the severest form known, taking a big toll of health. Men and women rolled into the mill dispensaries in their hundreds every day. It was a very pitiable sight of pale and yellow, miserable and shivering humanity with agony and wretchedness in their faces—added to which was the anxiety of loss of work and wages for long or short periods due to enforced absence as a result of the crippling malady.

ing hot-beds for swarming filariæ. When the time comes, quinine, and that too of a low quality, is doled out as an eyewash for the public that the Corporation has done its duty! It is no use blaming the health officers of the Corporation. They cannot do wonders with limited monetary and staff resources at their command. The problem of malaria in Bombay is so big that, unless a large scheme is backed by big finance and a competent staff is specially engaged, one can never change the present unsatisfactory state of affairs. Other countries have wiped out malaria from their midst and Bombay can do likewise. The question of finance must never be put

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forward as an excuse as human life and human well-being is the only thing that the body corporate has a right to think about. And, to honour this charge, she is entitled to beg, borrow or steal from the public. It is not drink that is killing the people wholesale, it is fever. Twenty-five years ago, at the request of Dr Bentley, the Corporation sanctioned the miserable sum of Rs. 60,000 per year for fighting malaria. Since then Bombay has grown four times and yet not a pie has been added to this grant to fight this mighty scourge.

Workmen's Compensation Act

There has been no greater or finer reform in the factory laws of Bombay than the Workmen's Compensation Act which provides for not only compensation for lost limbs and eyes, etc., but for wages during the period of absence due to injury. When I recollect the state of affairs several years ago before this Act came into force, I can easily appreciate the blessings of to-day. I know of a time when men with heavily infected and painful wounds used to be forced to work by cruel and relentless jobbers, who at that time were badmashes of the deepest dye, all-powerful in the mills, without whose help labour could not be obtained, who were bribed for their work from all quarters and were mostly drunkards and bullies. To-day they are not the same kind of men and their power is broken. In well-regulated mills strict orders are given by the management that the slightest injury or wound should be at once brought to the mill surgery for first aid and dressings with the result that even slightly infected, leave aside badly infected, wounds are extremely rare and healing takes place with little pain and less delay owing to rest and surgical cleanliness.

Mill Dispensaries

The Millowners' Association, Bombay, has created much useful reform in the mills under its membership, but it is a wonder why it has not thought of a movement to eradicate, in a systematic manner, the present state of inequality in the efficiency and excellence of the several dispensaries of the mills under the Association. Whilst only a few mills are equipped with fine up-to-date and clean dispensaries, the majority are lowly mean hovels that can ill claim the attribute of a dispensary, being generally devoid of the slightest pretence to hygienic display or scientific work about them. These mills pay their doctors badly, do not provide medicines properly for the sick with the result that patients have no confidence in them. On the other hand, the well-equipped dispensaries have only to be seen daily for the great

popularity they enjoy, with the staff often overworked. Reform in this direction is, therefore, an urgent necessity, and the sooner that is undertaken the better.

Sickness Insurance

A very thorny and a very difficult question of the future is that of sickness insurance in this city. To my mind it is difficult to undertake it until a time comes when the textile industry as a whole is in a really flourishing condition, and it will be far from that for years and years now, as a result of its being exploited by Government and labour alike. If, however, the time comes, the finance for such an Act will have to come from the combined coffers of the Government, millowners and labour itself. It is only when you ask the co-operation and contribution of the worker himself to it that you will find that he will be reluctant to abuse the Insurance Act, and pretend sickness. There is much of this pretence even now when no Insurance Act exists, and medical officers will have always to be on the alert, with their wits all sharpened, to separate the genuine from the unreal and thus prevent the Sickness Insurance Act from gross abuse. In spite of even Herculean difficulties, it cannot be gainsaid that, just as the Compensation Act has been a great boon to the worker, so will this Sickness Insurance Act, and possibly, to a greater extent However, in the language of Edmund Burke, "At present all is troubled and cloudy and distracted, full of anger and turbulence both at home and abroad, but the air may be cleared by the storm and light may follow it."

Another reform which I have always advocated in the last several years is the provision of hot-water shower-baths in the different mills after work—not the luxurious shower-baths of the rich but an unpretentious row of simple cubicles with pipes and showers, the whole not costing much. Steam is always available at the mills to heat the water and does not cost the companies anything in the way of extras, as that generated for power may be utilized also for heat. The cost of the water-supply for these baths must be shouldered not by the mills but by the Municipality. I am sure that these baths will reduce considerably much of the skin disease that exists in the industrial worker as will be seen from Table II furnished below.

Different Diseases

All skin diseases, however, are not caused by want of cleanliness and many of them are due to vitamin C deficiency. Vitamin deficiency is also to be found in (Continued on p. 235)

TABLE II.

Simplex Mills records, showing the total attendance for the last ten years at the mill surgery for different diseases. Note the large number of Skin Disease cases.

Years		Accident Injuries	Gastro Intestinal	Skın Dıseases	Respira- tory System	Genito- Urinary	Nervous and Muscular Systems	Teeth	Eye	Ear	Nose and Throat	Fevers (Malarıa)	Other Fevers
1929 1930 1931 1932 1933 1934* 1936 1937 1938 1939		7,490 5,450 5,733 6,522 7,398 7,862 9,381 8,727 9,028 10,149 8,071	4,083 2,463 2,795 2,626 3,226 3,846 4,283 4,763 3,953	7,295 7,155 7,082 8,726 7,374 7,483 8,072 8,169 9,258 10,040 8,671	4,178 2,135 1,997 1,933 1,662 1,946 2,686 2,686 2,265 2,600 2,767 2,147	947 551 316 332 419 547 547 469 640 751 602	6,302 4,739 3,969 4,230 3,296 3,867 4,183 4,469 4,902 5,006 4,687	1,321 785 807 962 792 1,212 1,414 1,637 1,884 2,057	1,446 999 906 1,300 1,299 1,522 2,087 2,159 2,509 2,724 2,484	1,720 1,347 1,406 1,555 1,369 1,683 1,788 1,824 2,156 2,237 2,174	664 498 426 585 728 9907 1,758 1,262 1,561 1,841 1,573	3,790 2,390 2,412 2,559 2,097 3,054 2,853 2,594 2,858 2,652 4,195	884 351 336 408 292 1,165 1,360 1,156 1,590 2,126 1,651
Total	•-	84,811	38,235	89,325	26,310	6,121	48,650	14,655	19,435	19,259	10,803	31,454	11,319

^{*}Ten months; strike for 2 months.



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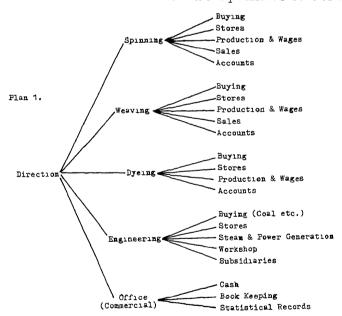
PRINCIPLES OF ORGANIZATION

Βv

FYYAZUDDIN AHMAD, Dip.Ing., G.I.M.E.

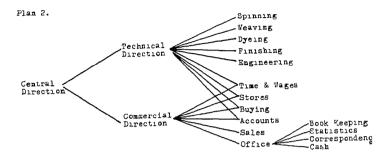
THE complexity of modern business enterprise requires a deliberately planned structure, a skeleton, within which all its activities have to be planned. This is the initial organization and it has to be drawn up logically with due consideration of all the necessary relationships and certain principles found by long experience to be worth incorporating in practically all business organizations. The tendency to-day is towards division of labour, specialization, centralization, the division of responsibility, etc. As a matter of fact, the guiding principle is the division of labour; specialization, centralization, etc., being corollaries and problems necessarily arising out of the division of labour.

It does not need an economist to see that all the functions that go to make up the activities of an enterprise are best divided up and each placed under the quidance of an expert In principle it is simple enough, but in practice it gives rise to difficulties. It is, for example, not in every industry that these functions can be divided up so easily as in the textile industry. There is the spinning, the weaving, the dyeing and so forth, all fairly characteristic functions which can, and as a matter of fact must, be divided up into watertight compartments A further difficulty, however, arises from the fact that not every enterprise is in the fortunate position of having an optimum as regards the size of each department. There have to be compromises. Plan I shows what is meant by the functional division of labour, besides emphasizing the fact that each of these departments involves certain types of labour that are common to all of them. It would be a primitive sort of an



organization and an extremely elementary example of centralization if it allowed such functions as buying, wage calculations, storekeeping, etc., to remain as burdens on the different manufacturing sections. The main purpose of functional division is to utilize the advantages that centralization and the consequent specialization gives. It will have become obvious that a "centralization of functions" rather than a "centralization of authority" is being advocated here and as the "centralization of authority" is exactly the thing that

has to be avoided in modern forms of organization, except in certain very exceptional cases, it is well to differentiate between the two interpretations of the word. Now Plan 2 shows some improvements as far as specialization is concerned over the previous plan, and further illustrates what is sometimes known as "inter-grouping" It will be noticed that in Plan 1 the



central direction has five departments under its direct control whereas in Plan 2 two other "directors" have been introduced who administer the technical and the commercial sides separately and are in their turn responsible to the central direction, thus relieving the burden of the latter considerably. It will hardly be necessary to explain the technical and the economic advantages of specialization; only a warning against allowing it to degenerate into a mere catchword may not be out of place. Nothing is more likely to make one lose sight of all its implications, and that such a thing is a possibility is shown by the fact that specialization is often not carried to its logical ends. The existence, for some obscure reasons, of departmental stores despite the creation of a central store and the splitting up of wage calculations are ordinary examples Of course, such forms of specialization as the separation of the productive function from that of maintenance require deeper study and more careful management and are not often met with in the textile industry although quite prevalent in the machine manufacturing industries. It has not been incorporated in the plans for the sake of simplicity although it is a thoroughly commendable practice. All the circumstances in the textile industry are favourable for such a specialization, especially in India where the machinery costs are much higher. Similarly, there are many other possibilities of specialization and an organizer who wishes to take full advantage of it must study every detail of the process, indeed every hand movement of the workers. In many industries this has become so imperative that a separate time and motion study department has to be created in order to be able to rationalize and standardize, mainly with the help of specialization.

Division of Responsibility

Another problem arising out of the division of labour is the division of responsibility. It is no longer thought advisable to have all the responsibility concentrated in one point because, to put it mildly, it is very difficult for one person to master even the major details of a complex industrial institution. The tendency to-day is to "place the power of decision as close as possible (Continued on p. 263)

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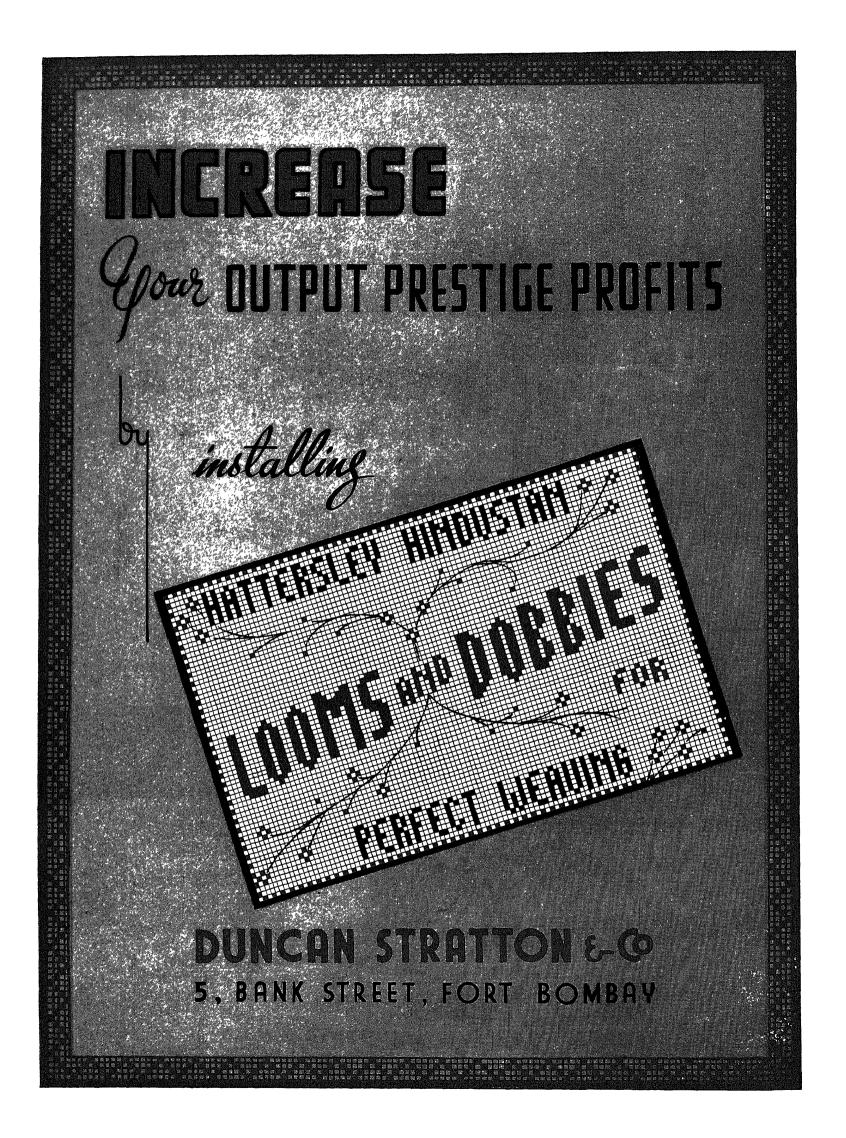
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MILL BUILDINGS IN INDIA DURING THE PAST QUARTER CENTURY

В

D. W. DITCHBURN, F.R.I.B.A., F.I.I.A.

THE chief centres of the cotton mill industry during the past half century have been located in Bombay Presidency, and to a lesser degree in Indore and Mysore districts, and in view of the general progress which has been achieved in all directions during that time it may not be out of place to attempt to analyse the progress which has been made in one branch of that industry, namely, the buildings in which spinning and weaving have been carried on.

The first cotton mill buildings to be erected in India were based on the Lancashire models, comprising two and three-storied structures. To some extent this was necessary in places like Bombay where the value of land was a very great consideration, but in many other localities where such land values were of no great moment, the buildings consisted of a ground floor only.

A further factor determining storied structures is the nature of the subsoil. Take, for example, the construction of single-storied buildings on black cotton soil which, all who have to build upon it will admit, is most treacherous; in parts of Indore where trial pits of 17 or 18 feet revealed the soil to be of the black cotton variety, it was formerly considered uneconomical to build single-storied buildings. The one great disadvantage of these storied buildings is the inadequate lighting of the lower floors. Where it is possible, therefore, it is generally conceded that the ground floor structures which can be adequately lighted by the usual north-light roofs are the most desirable form of construction, both from the building and the production points of view. With the experience which architects and engineers have acquired in respect of building in black cotton soil, great depths are not now considered necessary if special foundations are designed to counteract the treacherous nature of this subsoil.

A general survey of the buildings erected to-day shows little advance on what was done half a century ago, with the exceptions, perhaps, of eliminating many of the columns, but this can only be done satisfactorily in the single-storied buildings where individual drives are adopted, as it would be impossible to treat storied buildings in the same way on account of the heavy loads which have to be carried over large spans of the upper floors. Such increased costs would be uneconomical, and would certainly not be considered by the mill agents whose function it naturally is to keep the cost of their buildings down to the minimum consistent with their production requirements.

During the 1914-18 war and for a short period after the conclusion of hostilities, the mill industry was in a flourishing condition, and some companies paid out their profits as dividends to shareholders whilst others more wisely invested their surplus capital in buildings and increased their reserves. The Sholapur Mill, for example, of which the late Mr Narottam Morarjee was the moving spirit, made some extensive building additions during this period. Four entirely new mills were

erected in Indore, and many extensions were made to existing mills in Bombay and Ahmedabad. These, however, were all based on the older models.

On account of the collapse of a portion of one of the mills in the latter city, the Factory Inspector required all the mills to be surveyed by competent architects or engineers and reports made as to the structural stability of the buildings. The writer reported on a number of these mills and found some of them not conforming to standard mill practice. In one case where excessive vibration was felt, it was found that the walls increased in thickness from the base upwards, a reversal of the usual elementary principle of making the top walls the thinnest increasing the thickness towards the base

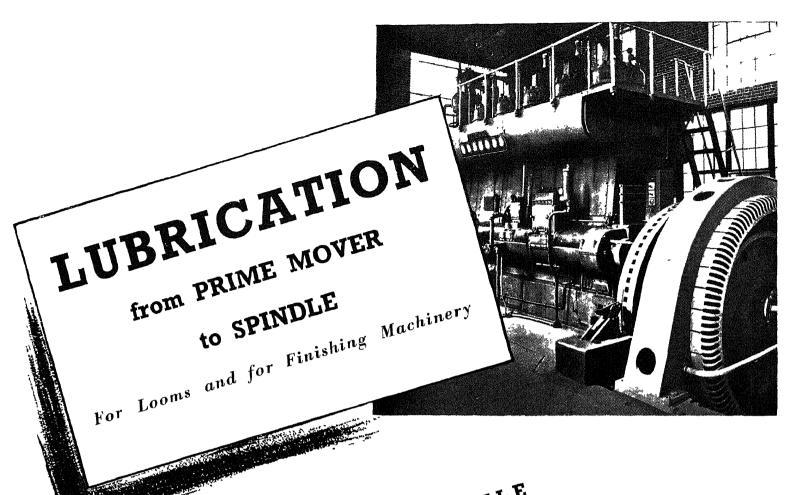
In this particular instance the ground floor walls were 9 inches thick, the first floor 14 inches, and the top nearly 16 inches thick. Fortunately the loads of the upper floors were taken by cast-iron columns built into the wall, but even so it was amazing that the walls supported the superimposed load of the walls themselves particularly, having regard to the vibration transmitted to the walls.

Curious Features

Many curious features have been found from time to time in the older mills, due to the fact that additions were entrusted to the Mill Engineer, who had not only his usual routine work of looking after the mill machinery but was called upon to devote his time and attention to the erections of new additions to and repairs of buildings. In the case of a collapse of a mill building erected by a mill engineer, it was discovered that the foundations took up all manner of levels and angles in possibly an attempt to follow the more compact strata of the subsoil, without the usual method of "stepping" of such foundations known to architects and civil engineers. In this particular mill also all the column foundations were weak and had to be strengthened. Most of the mill agents have now discovered that it is not always economy to entrust such work to their mill engineer and, furthermore, it is asking too much of the average engineer to undertake such work, which is a lifetime study of the other professions of the architect and civil engineer.

Many extensive additions were carried out to mills in Bombay: the Jacob Sassoon Mill was one in particular which was remodelled after the war. The Kohinoor Mill, one of the best managed of the mills in Bombay, has been making additions and alterations to every department gradually but with a view to the future until the land is almost covered with well-laid-out buildings which reflect the keen foresight of the agents and management.

There are many mills standing idle to-day, some of which have disposed of their machinery, resulting in very small concerns which have sprung up in Bombay and elsewhere. Some of these miniature mills have had to close down after a short time, no doubt from the lack of capital.





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A few of the older mills which had closed down have been taken over by other mill agencies, but three are worthy of note, the Modern Mills, the Courtauld Mill and the Pralhad Mills

In 1935 the Modern Mills purchased the Bomanji Petit Mills and under the direction of the late Mr D. N Sirur, the Managing Director, this mill was entirely remodelled. Entering the ground floor loom shed which covered an area of over 60,000 sq. feet, the impression was that you were entering a forest on account of the multiplicity of cast-iron columns. Many of these were removed and the subsequent impression was not quite

The late Mr. Sirur had a keen sense of the propriety of architectural detail, and the elevation of this mill to Lamington Road is an example of how a blank wall may be artistically treated. The mill erected at Bangalore under his direction in the period immediately succeeding the last war was also an example of the pleasing effect which can be obtained architecturally if only those concerned in the construction of these buildings would co-operate with the architect and not centre their minds entirely on cost and dividends to shareholders.

Another entirely new mill was erected in 1920-21 in Nagpur for that veteran Indian politician and millowner, Sir Maneckji Dadabhoy. Here again the effort to make the buildings presentable was rewarded in the pleasing effect obtained.

An architect will always endeavour to make his buildings look attractive if allowed scope to do so and he should be supported by the agents in achieving that object.

Another mill which up to the present time has had a chequered career is the former Bombay Woollen Mill. Many of the buildings were burnt down in 1920 and the older inhabitants will doubtless remember the late Mr. Addyman who was the manager, and who for some time represented the European Association in the Legislative Assembly. The reconstruction of the mill buildings was carried out during his managership. The mill which had prospered so well during the late war did not, however, last very long after its reconstruction, and was closed for some time before Messrs. Courtaulds converted it into a silk mill.

Messrs. Killick Nixon & Co. have recently purchased the property, which is also called the Kohinoor Mill, and under the present direction and management prosperity should once again return to this mill.

Another mill to change ownership is the present New Pralhad Mills which has been taken over by the B.M.D. Agency. This mill was very largely erected by Messrs. Ahmed Rahim and Sons after the last war and has also passed through troublesome times. The present agents and management are gradually remodelling and extending the various departments in the process of modernization and this is another of the older mills which should be assured of a successful future.

There have been very few mill brick chimneys erected since the last war on account of the more extensive use of electric power, etc. The writer, however, designed two chimneys since that time, one in Ahmedabad and the other in Bombay, the latter being for the Morarji Goculdas Mill. From experience of the older mill chimneys it was found that most of these cracked in the base and even in the shaft, regardless of the fire-brick lining construction. Although it appeared at the time to be perhaps a little wasteful in increasing the thickness of the brickwork at the base and in the

lower portion of the shaft, the results have satisfactorily achieved the object of preventing the cracks.

Among the new industries introduced into Bhopal is the cotton mill which was conceived and brought into being by the Managing Agents, Messrs. Forbes, Forbes, Campbell & Co. The buildings were completed over a year ago, and the mill is now working. The spinning and weaving departments are a delight to any engineer, for these buildings are devoid of the usual long lines of columns. It makes a vast difference to the look of a factory to see the wide open spaces with nothing to detract from the lines of the machines. This I think may be considered as the most recent factory practice.

The Matunga Technological Laboratory

Shortly after the completion of hostilities of the last war Mr B. C. Burt (now Sir B C. Burt) of the Government of India, came to Bombay and, in collaboration with the writer, the Technological Laboratory at Matunga was designed and constructed for the Indian Central Cotton Committee. The spinning block was the first building to be erected, and as this was in the nature of a mill building, the Improvement Trust made it a condition that the design should be such as not to detract from the residential character of the locality.

The technical section of the Committee's work and the compilation of data are carried on in a separate laboratory building. No one passing the site would realize that the spinning of yarn was in progress behind the attractive front elevation. The Spinning Department is north-lighted but these are formed in the flat terrace roof with square box-shaped concrete enclosures above the terrace level with steel windows forming the north-lighting. Since that time various additions have been made to test all manner of cotton and all such data obtained are tabulated and made available for everybody's information and improvement of cotton growing and yarn production in all parts of India. The most recent addition to the buildings is the Ginning Block which will be in operation before this is in print. It may be of interest to note that the spinning block has been air-conditioned, regulating the humidity and temperature.

There is doubtless a difference of opinion as to whether it is desirable to house the mill employees as the experience of different localities will show. In Ahmedabad various housing schemes have been brought into being by some of the more enterprising of the millowners with, it is understood, a large measure of success. These are in the nature of small colonies with their recreation rooms, hospitals, etc., and contentment has been the predominant feature until labour leaders appeared on the scene and incited the occupants to strike or ask for more wages. The Gokak Mills have no doubt their own opinions as to providing accommodation for employees in view of recent experiences

The Kohinoor Mills erected chawls for their workers, but for some considerable time after completion only a few of the families would occupy the rooms. Recently, however, these chawls have been very popular and the workers have seen the advantage of living close to their work.

The Government authorities have very rightly insisted on the allocation of a part of the mill premises for creches which enables many women to work in the mills who would be otherwise prevented from doing so, and this has undoubtedly been a move in the right direction. Much, however, can be done in the design (Continued on p. 233)

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RAILWAY RATES AND COTTON INDUSTRY

M. C. MUNSHI, M.A.

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TO-DAY every one recognizes that railways are the arteries of commerce. To the student of industrial development, however, the railway is not only a striking example of the great large-scale industries—not even merely that, more than any single factor, the railways have brought about the industrial revolution of the mid-nineteenth century—but that they emphasize that success in business is possible only to the man who gets as low freight-rates as his competitor does. Rightly has it been said that favours in rates might easily mean a fortune

In the following paragraphs we are concerned with the relations of India's premier industry with India's principal system of transport; for, on the one hand, we have the industry that now supplies no less than two-thirds of the requirements of the entire population (taking the annual consumption of cloth *per capita* at 16 yards), while the railways, with a mileage of 41,134, have average earnings per freight ton mile of 5.98 pies (taking 88.36 miles freight tons originating and the earnings from carriage of goods at Rs. 63 crores for 1938-39). The quantity of cotton consumed by the textile mills increased from approximately 400,000 bales (of 392 lbs each) in 1880 to 2 million bales in 1920 and just over 3 millions in 1937.

Peculiar Growth of Rate-Structure

It is an oft-repeated charge that our railways have been built and the rate-structure is maintained with a view to catering more to the needs of foreign trade than with the object of developing internal commerce² (and the internal trade is estimated to be anywhere from 6 to 15 times our foreign trade) Before, however, we examine this charge with special reference to the cotton industry, it is useful to remember that the groundwork of the railway construction and the freight rate policy was laid at a time when our economy was and was believed for ever to remain almost wholly agricultural and that despite numerous searching inquiries and much informed criticism it has in the main remained unaltered. The whole charge is indeed a very grievous one,3 and can be examined from several points of view, viz, planning of railways, railway finance, the nature of the monopoly, competition of markets, etc. The rates-structure naturally reflects the predominance of the principles adopted by the railway administration as, for instance, the individualistic policy followed by our railways—which underlines the aforesaid charge. We shall presently refer to this point in detail, but it may be emphasized that this is true despite the fact that the Government have accepted the principle of nationalization and that they have taken over and manage some of the more important lines 4

While we are not primarily interested in the controversy between our railway administrations and the mercantile community we may note that while the former claim that they adhere strictly to the principle "what the traffic will bear " the latter assert that in many cases the rates are what the traffic can (as much as it will) bear-" the obvious but the short-sighted and ineffectual way." Perhaps the main ground for this charge is that the railways have not been in close touch with the trade and industry of the country; and this is admitted even ın official quarters 6 It would take us far out of our present purpose if we deal with this question further or even if we examine the bearings of the value-ofservice or the cost-of-transportation principle. But we may usefully compare the average freight-rate charged in our country with those in some others 7

Country Year Great Britain	verage Receipt per ton mile in cents
Italy 1931-32 South Africa 1931-32 U S A 1933	
South Africa 1931-32 U S A 1933	1.87
U S A 1933	1.69
	1.35
Canada	1 003
Canada 1932	0 94
British India 1931-32	0 832
Japan 1930-31	0.63*

^{*} Mr Robertson opined that the Indian rate must be not higher than one-sixth of the British in 1901

When we come to the question of the railway rates and cotton industry, we shall divide our study into two obvious parts—cotton, the raw material, and piecegoods, leaving out the third aspect—stores.

-Cattan

The Class-Rates.—Cotton, as is well known, is India's principal commercial crop. During the last ten years (1930-31 to 1939-40) the acreage averaged 23 millions and production 5.6 million bales⁸ and more than half the

⁵ For a recent enunciation of this principle and policy, see Railway Conference Association Bulletin, No. 2, 1938. See further, footnote

No. 9, p 117.

6 "The working of the Indian Railways lacked something of the real commercial spirit and the railways were not so closely in touch with trade and agriculture as they might be "Sir T. Wynne (one-time President of the Railway Board) in his speech at the general meeting of the B N Railway 1936, see Report of the Indian Merchants' Chamber, for 1936, p 169

7 Bulletin No 2, 1937, Railway Conference Association.
8 During the last three years there has been a notable decline.

Acreage Bales

Acreage Bales
1937-38 . . . 25 7 million 5 7 million
1938-39 . . . 23 4 , 5.0 ,
1939-40 21 3 , 4.9 ,

vide Dr Burns' article in the *Times of India*, dated 25-10-1940 (Supplement)

For slightly different figures see Sir C. V. Mehta's article, *Times*

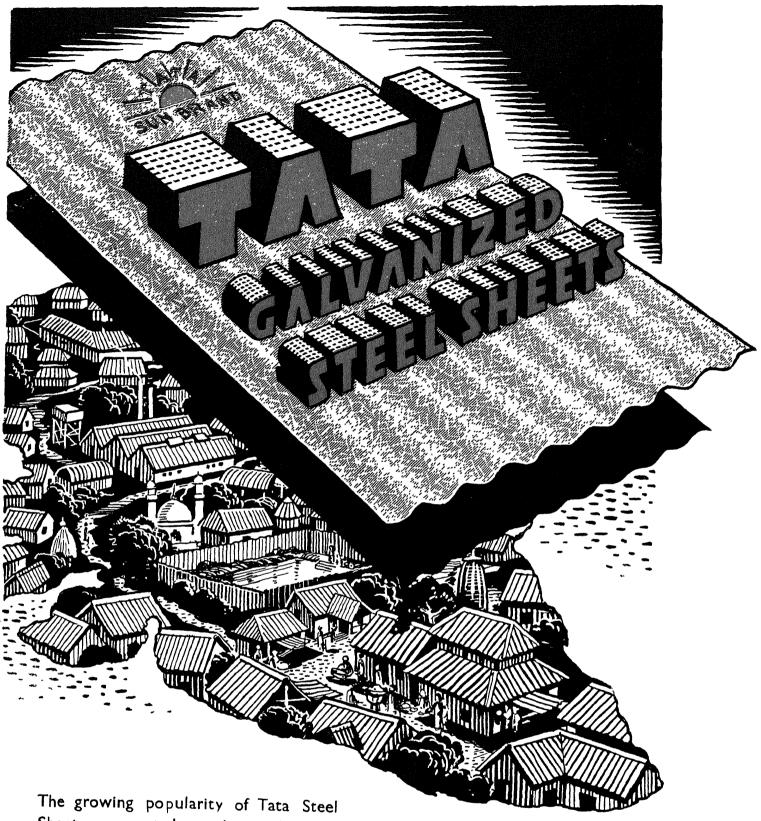
Trade and Engineering, April 1939

 $^{^{\}rm 1}$ The net earnings per train mile for the same year (1938-39) were Rs $\,$ 1-13-0 $\,$

 $^{^2}$ It is interesting to note that Mr. T. Robertson was one of the most outspoken of the early critics who emphasized this point of view very clearly. See. R S C. P. Tiwari, "Indian Railways", pp. 457-58.

 $^{^3}$ ''If," says Ackworth, "the railway is not useful as a railway, it is useful for nothing else. It represents sheer waste of capital, a well sunk without finding water, a ship built and fitted that will not sail"

⁺ Cf. "We have built up the rating structure on a policy of separate organizations and you can't very well depart from that unless you are prepared to revise the whole rating structure." Mr. Rose before the Tanff Board on Salt Industry. His other answers to the President's questions in this connection are also illuminating. See Vol. II, Evidence, pp. 148-149



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total output is consumed by the 380 odd cotton mills in the country Of course she is the most important cotton exporting country after the U.S.A. but, obviously, with this last aspect we are not directly concerned.

Since 1922 raw cotton for the purposes of transport by rail has been classified into full-pressed, half-pressed and loose. Confining ourselves to the first sub-division in the goods tariff, it is classified as the 4th Class R.R. subject to special sub-classifications on the different lines to meet their peculiar requirements. Thus the B. B. & C. I. Railway, in addition to the acceptance of the general classification, has a special rate, viz., for fullypressed cotton booked for certain stations to Bombay (B. P. T. Railway), where the ordinary rate is reduced by 2 pies per maund Similarly, the E. I. Railway modifies the general classification when such cotton is carried at owners' risk from E. I Railway stations (and via) to Howrah. The 4th class rate is then reduced by 6 pies; while on the G I. P. and N. W. Railways a like reduction is made from the general C Schedule and the 4th class rates respectively

The Main Lines. - Of the various lines three are the most important carriers of raw cotton. The G. I. P., the B. B. & C. I. and the N. W. Raılways haul approximately three-fourths of the entire tonnage and out of these three the G. I. P is the most important. Curiously, however, it is the G I. P. that classifies raw cotton at a higher general rate than others. Incidentally, it may be noted that the G. I. P. is a State-owned and State-managed Railway and not a primarily commercial concern. It may also be noted, in passing, that as the price of cotton is determined by international forces the transport charges are not passed on to the consumers and so a lower freight is bound to help the agriculturists

The Rates.—Let us now briefly examine the rates for raw cctton. The following tables summarize the progress of the rates on the G. I. P. and B. B. & C. I. lines from the principal forwarding centres to Bombay during the last two decades .-

G. I. P. Railway Freight Rates to Bombay per maund of cotton.

Distance in Miles	Forwarding Stations	Rates in 1911 and 1917	Rates in 1934	Rates in 1938
239 232 261 280 363 419 353	Dhulia Pachora Jalgaon Erandol Road Akola Amraoti Khandwa Nagpur	Rs a. p 0 11 6 0 15 1 0 14 7 0 13 6 1 6 2 1 4 7 1 2 8 0 14 1	Rs. a p 0 14 2 1 2 1 1 10 4 1 15 0 1 3 2	Rs a p 0 14 2 1 2 1 1 15 0 1 3 2

B. B. & C. I. Railway (Bombay Carnac Bridge)

Distance in Miles	Forwarding Stations	Rates in 1911 and 1917	Rates in 1932	Rates in 1938
147 165 171 195 202 218 227 348	Navsarı Surat Sayan Ankleshwar Broach Palej Miyagaum Vıramgaum	Rs a p O 3 11 O 4 6 O 4 9 O 4 9 O 6 2 O 6 7 O 8 10	Rs a p. 0 8 7 0 9 6 0 10 0 0 11 2 0 11 5 0 12 3 0 12 3 0 1 3 0	Rs. a p 0 9 1 0 10 0 0 10 6 0 11 8 0 11 11 0 12 9 0 13 3

Space forbids dilation on the various issues these tables raise, such problems as the rate from Pachora being lower than that from Dhulia although the distance is greater in the case of the former or the rate from Nagpur. Suffice it to say that G. I. P. rates are generally higher than 1 pie per maund except where competition from other lines has forced them down It may also be noted that the B. B. & C. I. Railway has, in recent years, increased the rate more than the G. I. P. has done. There is also a bigger problem that cannot escape emphasis, viz, that the general level of the rates has not been diminished at all; whereas the price of Broach cotton during the year 1910-11 ranged from Rs 300 to Rs. 375 per candy (784 lbs.), in 1917 about Rs. 425 and during the years 1932-34 it stood at Rs. 200, in 1938 it fluctuated from Rs. 150 to Rs. 200. It must be added that the argument here is not for altering the rates according as the prices of commodities fluctuate; for railway rates should not be varied as frequently as prices do. But we have here a curious exhibition of that famous formula, viz., what the traffic will bear.9 But the railway authorities are not content with this argument. In a recent letter to the Secretary of the East India Cotton Association, the Director of the Railway Board avers that it is not sound policy to alter freight rates from time to time to meet trade fluctuations; and further that if they did so it would create an invidious precedent and that in a period of trade depression it would mean a falling off in the value of the traffic and a sacrifice of revenue when they could least afford to do so. 10 This is rather surprising, for, the Member in charge of Railways earlier in the same year had admitted the force of these criticisms when he claimed that a good deal of long-distance traffic from and to ports was now swinging over to internal traffic and that the railways must continue to watch any changes of that kind and adjust themselves to the different conditions that had arisen or might arise.11 It may as well be noted in passing that the N.

and the E I. Railway granted 20 per cent. reduction as a special case. 12 But this meant putting certain buyers at an advantage over the others. Our point here, however, refers not so much to the reductions as to the enhancements that have been effected from time to time, some of them as high as 150 per cent. and some nearly 100 per cent, at a time when prices have been notoriously

There is, again, one more feature of the rate-structure that cries aloud for reform. It is the discontinuous mileage system—the practice in the case of traffic passing over more than one system (line) at schedule rates of calculating the rate on the local distance over each system instead of on the through distance over

(Continued on p. 257)

⁹ The Railway Conference Association Bulletin 2, 1938, elucidates the principle as:

[&]quot;The sense is better expressed by the phrase 'value of service rendered' that is, charging for the transportation of each commodity what it can afford to pay. The principle forms the basis of the present system which has been evolved as a result of experience garnered over a long period of years and has been accepted by all countries where railways are run on a commercial basis. It is equitable because it permits of a reasonable charge on all commodities in relation to their ability to pay. Thus a commodity of low value like grain pays less than a comparatively highly valued commodity like cotton or piecegoods and so on."

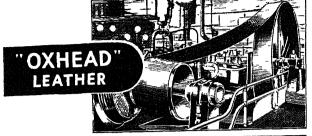
¹⁰ Letter No. 1505 T, dated 24-12-1937.

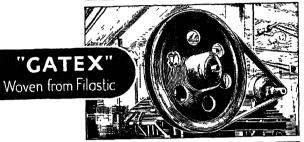
¹¹ Legislative Assembly Debates, Sir M. Zafrulla Khan's speech on 18-2-1937

 $^{^{12}}$ Cf. The correspondence of the E I. C Association and the Railway Board, dated 22-11-1937 $\it et\ seq$

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PROGRESS IN COTTON SPINNING

Bv

J. W. NORRIS

ANY improvements have been introduced in cotton spinning machinery since the early days of the domestic hand-spinning wheel. Working conditions have also been improved in recent years in the spinning section of cotton mills, owing to suction arrangements carrying the dust, etc., by pipes from the machines direct to the dust chambers, and air-conditioning inside the mills, leaving the air much cleaner for the operatives to work in In the past, more labour was employed in handling the cotton after the bales were opened in the mixing room, compared to the automatic system now in use.

The cotton, after being separated from the seeds by ginning, is hard pressed into bales of 400 lbs Indian cotton, and 700 lbs Egyptian cotton. On arrival at the mills, the cotton is opened out again into a loose state and put into stack mixings in the mixing room.

Until about the year 1886, there was actually no machine in use for preparing the cotton for the stack mixings. The method in use was for a number of men to tear the bales into flakes and build it up into stacks by hand, in the same manner as building a hay-stack

At or about the above-named period, a machine called the Bale Breaker was evolved. This consisted of a feed lattice and 4 pairs of star or spiked rollers, varying from 6 ins to 9 ins dia with a draft of from 200 to 300 between first and last pair. This machine, although not a great success, did reduce the labour problem to some extent. As the cotton emerged from the last pair of rollers, it was delivered on to a short floor lattice which conveyed it to a pair of vertical lattices, upto, or near the roof, thence to another horizontal lattice with arrangement for dropping cotton at any predetermined position.

This system prevailed until about 1900 when the bale breaker was superseded by the Hopper Bale Opener, which is essentially a hopper feeder in general principle, but built up of stronger and more durable parts, to enable it to cope with the hard pressed flakes of cotton taken direct from the bale. The manner in which it treats the material is much more efficient than was possible by its predecessor.

Immediately after the advent of the hopper bale opener, when it was found that the cotton was more inflated and lighter in density, it was thought possible to convey cotton from the machine to mixings by a pneumatic system, hence came the practice of conveying the material by air, and dispensing entirely with the system of lattice work. This system of pneumatic transit permits of the extraction of a large amount of dust, sand, etc., at this early stage, which is reflected at each subsequent process by producing a cleaner yarn and improving the hygienic conditions throughout the entire mill

During recent years, electrical control of the various units forming a train of blowing-room machines has been introduced. They consist of mercury switches attached to swing doors and solenoids to catch boxes on hopper feeders. This method dispenses with rods

and levers, or wire rope arrangement of stopping and starting and is especially adaptable where mixing and blowing rooms are a considerable distance apart

Automatic Hopper Feeder

In 1890-91, the Automatic Hopper Feeder was introduced to take the place of the old system of weighing and hand feeding cotton to all openers, porcupine feeders or scutchers. This machine had a wonderful reception and, undoubtedly, stands out as the greatest achievement of the period under review, owing to its labour-saving and efficient method of feeding.

It is essential that an even lap is produced on the scutchers, and Mr. Edward Lord, of Todmorden, invented the piano, or pedal feed motion to scutchers, in 1862. This consisted briefly of about 18 pedal levers mounted on a shaft, and passing under the feed roller. At the other end, about two feet away, were hooks, to which were suspended fish-back-shaped levers, or pendants. These pendants passed through a slotted bowl box, and between each were two chilled anti-friction bowls. A simple system of levers conveyed the motion set up by any variation in thickness of feed to the strap fork in the regulator box, which in turn drove a pair of convex and concave cones, thence by worm and wheel to feed roller.

In 1897, the firm of Lord Bros improved this regulating motion by introducing the Tripod system of levers to take the place of the former fish-backed pendants and anti-friction bowls. The chief advantage of the tripod system is a more sensitive movement, less maintenance through wear of chilled bowls and less attention to cleaning, etc

In recent years, the Patent Shirley Cage and the Single Process system have been introduced. This system consists of one line of opening machines which automatically feeds two finisher scutchers, thereby saving labour.

To save power the beater shaft, pedal roller, and dust fans on the blow-room machines are put on ball bearings. Individual drive to machines by motors has also been introduced in this department.

Carding Engines

Carding is the most important process in cotton spinning. It is the final stage of cleaning wherein the minutest impurities foreign to the material and all immature fibre, leaf and broken seed ought to be removed.

The modern Card, like most other machines, is the outcome of the ingenuity of successive inventors. One of the most notable names in connection with the first successes in improvements in carding was that of James Hargreaves of Blackburn, the inventor of the spinning jenny. He introduced the stock cards used in the woollen trade into the cotton trade and improved and adapted them to the manufacture of cotton. Soon after accomplishing this improvement about 1762, Hargreaves was employed by Robert Peel, the founder of the family which afterwards gave the eminent states-

(Continued on p. 123)



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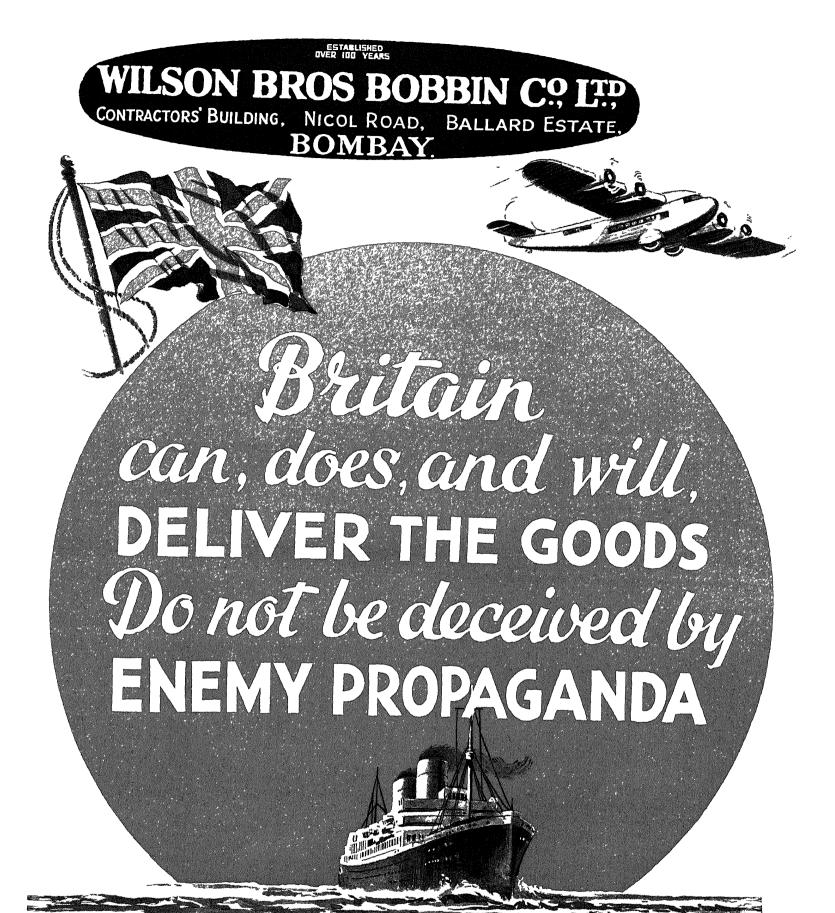
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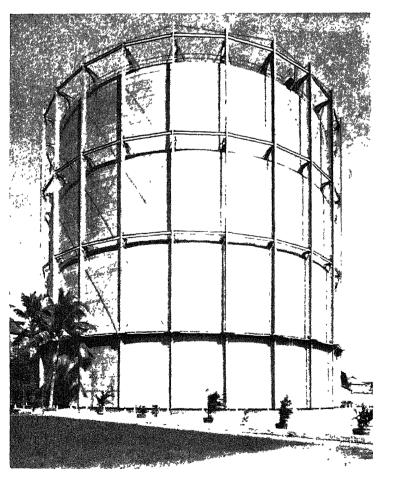
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man of that name to England, who resided in close proximity to the inventor at Oswaldwistle, to make for him a cylindrical carding machine which he succeeded in doing in a short time. This machine in its structure appears to have been the true parent of the modern card. In its first form, it had no doffer arrangement, the carded cotton having to be taken off the cylinder by the hand-card, women being employed to perform the work. The inventor afterwards added a doffer but it was not a success, consisting merely of a roller carrying a series of tin plates which being made to revolve, scraped the cotton from the cylinder and, of course, injured both cotton and the cards. Though for a long time lost sight of, this idea has subsequently been rendered a practical success, as may be seen in the Revolving Doffer. The invention of the Doffer Comb is attributed to Arkwright, who also invented filleting for card clothing in place of sheets which up to then had been in use. From this time, improvements succeeded one another at greater or lesser intervals. The sum of them, however, is the Flat Card as it is known to-day.

About the year 1922, the Shirley Card was introduced. This card has 48 flats instead of 106, fourteen of which are always at work. The cylinder diameter is 40 ins. and the doffer diameter, 20 ins. A feature of this card is that the licker-in at the back of the cylinder is higher than that of the ordinary flat card which allows the undercasings to be made longer which gives more cleaning.

The total floor space and height of this card is much less than the revolving flat card, but since its introduction it does not appear to have made much headway.

Combing

Combing may be described as the most highly perfected application of the principle of carding. Its chief purpose is to separate from the material all the fibres, that are in length below the standard it has been decided to use. In addition, it efficiently clears the cotton from vegetable and other impurities that may have escaped the carding process through which the cotton has first been put.

The combing machine was designed and invented by M. Heilmann of Mulhausen, one of the continental centres of cotton trade. This was a few years before 1851.

Drawing Frame

In the process of drawing several slivers, the products of the card are combined and attenuated to the dimensions of one. Every step in cotton spinning has a twofold object: the first being to carry the material a little further in the constructive process; the second, to eliminate or minimize the defects of the preceding stages. The constructive part of drawing is to further perfect the parallel arrangement of the fibres contained in the sliver, which is accomplished by the different velocities at which the rollers revolve and the proportion of which will be seen subsequently; the second is to render the sliver more perfectly uniform in its dimensions or in the number of fibres contained in a cross-section than it is when delivered from the card.

The Drawing Frame has attained its present degree of perfection very slowly. For a long time, it was impossible to overcome the difficulties regarding the occurrence of "single," though on every side numerous attempts were made James Smith, of Deanston in Scotland, was the first to secure a measure of success by the invention of the stopping arrangement which prevents "single" going through the machine. It has been

improved and perfected in several details by succeeding machinists who have now obtained with it a very sensitive action. The electric stop motion was introduced about the year 1875 and many improvements have been made since its adoption. In later years, the Ermen Top Clearer was invented and during the last ten years, the Oscillating Underclearer was introduced. When both these clearers are working in conjunction with each other, no clearer fly is allowed to pass into the sliver.

Speed Frame

The greatest difficulty spinners had to contend with on these machines, was the winding on the bobbin of the rove, owing to the increase in diameter of the bobbin after each layer has been wound on. The so ution of this problem was not satisfactorily solved until Holdsworth brought out his patent Differential Motion Mr. Samuel Tweedale also patented his differential motion in 1884, which has proved a great success. Another improvement of his on the speed frames of about the same time, was Balancing the Top Rails, and has been adopted by other makers of these machines. By this method of balancing the rail, there is practically no friction between the slides and spring-pieces as they act as guides only, so that the lifting wheel and rack have little more to do than overcome the friction of the balancing mechanism

The improvements in the speed frames have been more or less extensive in recent years, Four-Roller High Draft, Two-Zone High Drafting and Casablanca system of High Drafting, being introduced. Also, we have the ingenious method of driving the spindles and bobbins by helical cut gears and chain driving to both spindle and bobbin shafts. This undoubtedly reduces noise on the speed frames to a minimum and allows a greatly increased speed which gives a higher production.

Mule Spinning

The modern or mechanical system of spinning, properly commences with the invention of the jenny by James Hargreaves of Blackburn, which was superseded in its turn by Crompton's Mule.

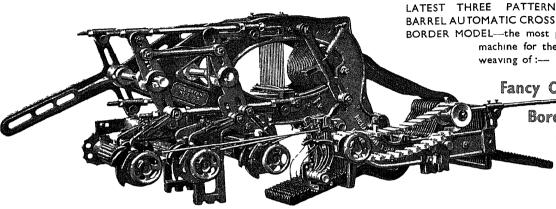
After the first fever of excitement resulting from the invention of Hargreaves' jenny had subsided, it was quickly adopted as it was found that one person could spin as much as ten, or even twenty persons using the old method But even this amount was not sufficient to meet requirements and there was consequently room for the invention of a machine capable of spinning a strong solid cotton warp yarn. Such was the state of matters when the attention of Richard Arkwright was directed to the improvements of spinning and weaving machinery It is not probable that Arkwright was engaged upon his celebrated spinning machine more than two years before he secured a patent for it in 1769. But incomparably higher than all his contemporaries. after Hargreaves and Arkwright, stands the name and services of Samuel Crompton whose invention of the Mule Spinning Frame has proved of such vast importance to the world

The mule up to 1790, was purely a manual machine, operated by hand Mr Kelly, of Glasgow, was the first person to adapt the machine to be driven by animal or water power. This invention had not been working long before Mr. Wright, a Manchester mechanic who was formerly an apprentice of Sir Richard Arkwright, doubled the dimensions of the mule by placing the head-stock or rim, in the middle of the frame. The Throstle Frame is the second of the mechanical spinning frames calling for notice. The Danforth Throstle, an American invention, was brought before the notice of

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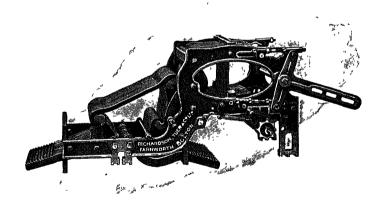
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DEVELOPMENTS IN THE PRELIMINARY PROCESSES OF WEAVING*

Ву

D. P. JOSHI, B.A.

THE last fifty years, i.e., from the year 1891 to the end of 1940, are hardly marked by any fundamental discovery on the manufacturing side of the textile line. In fact, there is no new process in cloth manufacturing which had not its germination long before this period, and yet it must be admitted that the period covered by the last half a century saw the progress in that line making rapid strides. This may appear rather paradoxical, but the fact is that many of the inventions in the manufacturing process had not gone beyond an experimental stage before the year 1890. It is during this century and specially after the end of the last war that impetus was given to bring many of the inventions into practical use. This has been conspicuously reflected in the progress of the Indian industry. No new invention is adopted by our mills unless it is known to have been previously tried by the industrial countries of the West with pronounced success, and unless there are reasonable chances of its being successfully worked in our mill environment. As stated above, however, the last fifty years are noted for the development of many old inventions of which full advantage was taken by the Indian mills which benefited very materially in consequence.

To the end of the last century, Indian textile mills had to compete only with the established industry of Lancashire, and the struggle was purely confined to medium counts of yarn and to qualities of cloth manufactured out of these The vast field of lower counts was, however, entirely left to Indian concerns From the commencement of this century a new and an even more formidable opponent entered the arena who practically left no field untouched. The competition was, therefore, felt in lower counts like 20s and the coarser qualities of cloth. This severe competition from new quarters put the Indian mills on the alert and they were consequently obliged to seek every help and expediency to meet it. Progress always lies along the path of struggle and competition. A number of new methods which were formerly left out as unpractical by our mills were successfully applied to the manufacturing process.

Beginnings of Indian Weaving Mills

Up to the end of the last century most of the Indian mills, especially those in the city of Bombay, were spinning mills depending to a great extent on orders for yarn from the Eastern markets of China and Japan. In 1893, the Government of India thought it expedient in the interest of this country to close the mints to free coinage and to link the rupee to gold. This significant step automatically appreciated the rupee in comparison with the silver currency of China and Japan, and affected most disastrously the growing spinning industry in India by closing to it for ever the Eastern markets. The export of yarn steadily diminished after 1893, and the Indian mills came under the necessity of consuming their own yarn in cloth manufacturing. The history of

the development of textile manufacturing starts, therefore, from this period. A number of new weaving sheds were afterwards added to the old spinning mills and the old weaving sheds were extended.

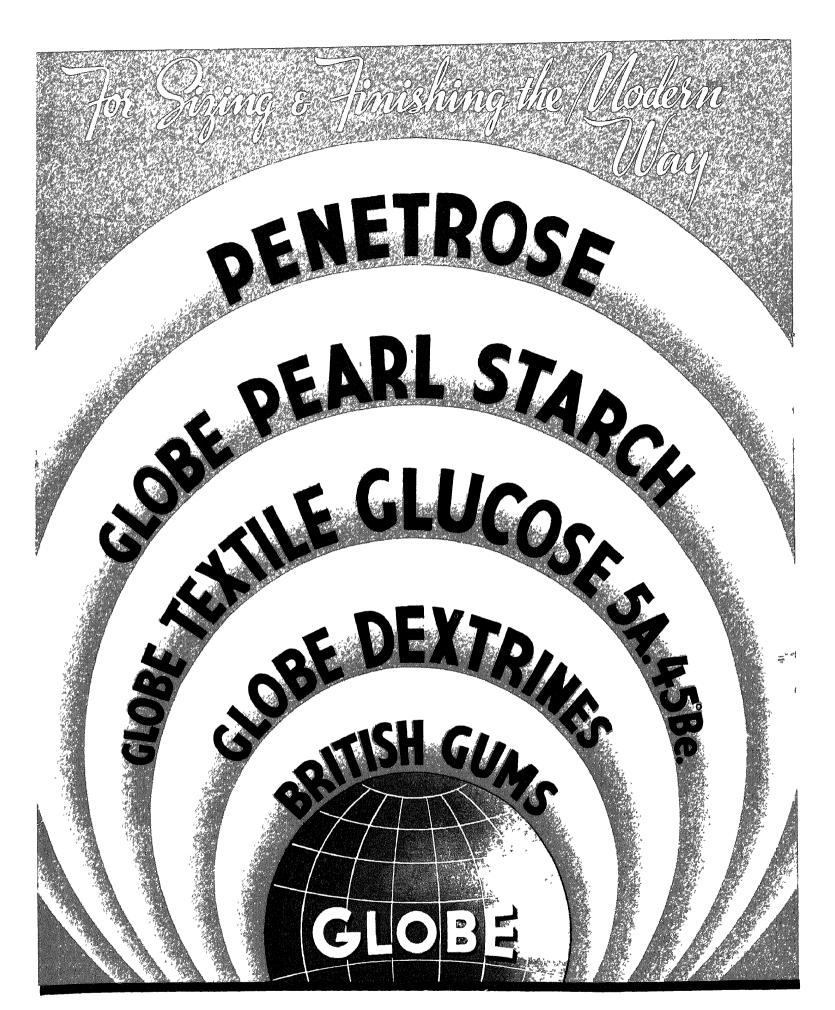
The Indian mills principally catered to the wants of the lower strata of society residing in villages and depending for their livelihood upon agriculture. This community is noted for its poverty and had, therefore, to satisfy the meagre want of clothing by the cheapest and the coarsest qualities. Our mills also were turning out counts to suit them. The machinery, therefore, ordered out at this period for the preliminary operations of weaving was very simple and such as would meet the requirements of these qualities.

Very few mills had then either a bleach or dye house on an extensive scale. The chief output of our mills was coarse grey cloth with a sprinkling of dyed yarn as required for the borders of the dhoties, and the manufacturing process that was adopted was (1) grey winding, (2) beam warping on to back beams, (3) slasher sizing from back beams on to weavers' beams, (4) drawing-in, (5) weaving.

Winding

The main object of a winding machine is to get the yarn transferred from cops or ring bobbins in sufficient lengths on to suitable forms for the subsequent operation of warping. As a secondary measure, tension is put on the yarn to take out weak places which are likely to affect the production in further processes and to remove bits of leaf, slubs and snarls left in the yarn in the spinning processes. Formerly double-flanged bobbins were used for getting a sufficient length of yarn. It was considered a suitable form for the operation of warping. The old winding machines had spindles on which these bobbins rotated by friction. They were of a simple but crude type, working in a double row of horizontal rails fixed one over the other at some distance. The lower of these received the pointed footsteps of the spindles while the upper one was provided with brass collars in alignment with the footsteps below so that the spindles passing through them could revolve freely. For detecting weak places in the yarn it was kept under sufficient tension while passing from the ring bobbins on to the warper bobbins either by flannel drag boards or by putting the ring bobbins on revolving spindles in a slanting position and withdrawing the yarn from the side. A band went round the wharve of the revolving spindles to act as a brake. The cleansing of yarn was done by passing it over a brush of bristles and through narrow slits in a vertical steel plate moving up and down alongside the thread guides.

Attempts were made in some Western Countries to dispense with the process of winding by using magazine creels in the warping for ring bobbins by tying the tail end of one to the nose end of the other. This innovation could not be adapted to Indian conditions as the yarn



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used in our mills was very coarse and even magazine creels could not have prevented frequent stoppages of the warping machines. Our yarn was rather full of slubs and snarls and was not so free from weak places as to do away with the process of winding with advantage.

Even though attempts were not made in India to dispense with the winding process a number of innovations had been introduced which in some instances are recognized as having revolutionized it Some have assisted it in removing more efficiently the defects in varn which the winding machine is intended to do A number of improvements in the construction of the machine have been effected during the last fifty years and adopted by our mills The spindles with long shanks are now discarded for the new type of spindles on the Rabbeth principle Being open in their bearings the old spindles required to be oiled frequently There was also the danger of the footsteps getting clogged with lint and dirt. This often hindered the work of the winders. The frequent oiling caused oily stains in the yarn More power was required to drive these spindles The new spindles revolved in a closed chamber containing oil, being therefore continuously lubricated and for months together they do not stand in need of attention The new spindles are fixed on one rail instead of two, as in the case of old spindles. The old tensioning arrangement by means of the revolving spindles was not uniform and varied with the varying size of warping bobbins There was the danger of overstraining the varn, when it was withdrawn from the ring bobbin above a certain speed. In some cases the yarn was found to lose its natural elasticity. Many Indian mills now prefer the ball drag arrangement for tensioning the varn The use of a suitable sized steel ball keeps a proper tension on the yarn without losing the natural elasticity. Another drag arrangement that is equally effective is the disk tension which can be adjusted according to the count worked either by decreasing or increasing the deadweight in the disk Both these have the least rubbing effect on the yarn The old process of using the slits in steel plates for cleansing the yarn is found to be most objectionable It has a very undesirable scraping effect and in the case of coarse counts all the short fibres stand out from the body of the varn Those which are loosened from the body by the sharp scraping action collect at the slits and form into buttons which are the cause of frequent breakages. The slits in the old machines were not adjustable according to the counts used Yarn rubbing against the plate forms serrations in the plate itself after some time. A number of new devices are now placed on the market which are known for their effectiveness without abrading the yarn. One of these is the Cooks T Guide Clearers and another is the Quixset Slub Catcher both these are adjustable to suit different counts

As improvements were made in other directions, the need was felt to bring new ideas into the working of the preliminary operations of weaving. There was an incessant demand for more production and better handling of materials in winding. The prevalent system of winding on double-flanged bobbins began to prove unsuitable and also inadequate for further operations in the case of the finer and better yarns that were being spun, as well as new artificial products that were being employed as cotton textiles from the beginning of this century. The machinists, therefore, began to look for new mechanical inventions, and the result of their endeavours was the development of a winding machine embracing improvements not only

in the design but in the construction of a new type of winding

Cheese Winding

The first radical departure from the old arrangement is the one invented by the late Mr S W Wardnell, who patented the Universal Spool or Cheese Winding Machine before the end of the last century With the advent of this machine commences a new era in the winding of a thread into a new form called a cheese in which can be obtained maximum length of yarn within a small size without much tension or friction on the yarn. The original machine invented was for a single cheese but it was afterwards transformed into a machine where a number of cheeses could be worked simultaneously. The main features of this machine are

- (1) The number of self-contained sections or spindles working independently from a common source and rotating at a very high speed
- (2) The spools or cheeses in spite of their size were always run with a constant velocity
- (3) The thread guides were worked with a quick traverse motion with an ingenious arrangement to lay successive layers of yarn side by side giving a close wind without making the ends of the cheeses cobwebbed or bigger in diameter than the body of the cheese

Later on with the object of attaining higher speed, the size of the cams working traverse rods was reduced, and the speed increased upto 500 yards per minute Still higher speeds were attained by camless windings in which the yarn traverses without the use of a reciprocating mechanism

The Schlafhorst Winding Machines making both cheeses and cones are working in some of our mills. They have dispensed with the cam system and in its place have introduced a new mechanism of rotating wings which act like split drums for guiding the yarn and as the rotating wings are very light the machines can run upto 800 yards per minute

The Universal Winding Company's No 40 High Speed Winding Machine for cones on grooved drums is also well adapted to Indian conditions. The drums, small in size but running at a high speed have grooves which cross each other. The arrangement is so ingeniously made that the drums make several revolutions before the yarn makes a complete traverse.

The introduction of the Cheese Winding Machines has given an impetus to the manufacturing of coloured sorts in India and many of our mills now venture to manufacture fine shirtings in high reeds and picks. The old practice of getting the yarn dyed in hanks and then getting it wound on to warper bobbins on colour windings is gradually disappearing. With the new system yarn, directly received on the ring bobbins, is made into cheeses which can be dyed in any fugitive or fast shades required The dyed cheeses, after drying, are worked on the warping machines. In some instances the yarn is wound first on cones and then taken to the warping machine for getting wound on perforated beams These are dyed on the same principle as that of the cheeses, and are returned to weaving to be used as back beams Both these processes are found to be very economical in reducing waste and overhead charges

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PROGRESS IN CLOTH PRODUCTION

В٧

B. B. JOSHI, L.T.M. (Hons.)

URING the nineteenth century Indian trade began to increase. The operations of the East India Company required easy transport and roads and railways were built. The establishment of communications during the period marked a new era in Indian trade and commerce with the result that English machinery began to be introduced into India. Before the advent of this new period in Indian industry, the chief source of income of the population was agriculture. Artisans among villages were servants of the people and were supplied by a fixed share of the year's produce from land. The payment generally was made not in cash but in kind.

Before the textile industry on modern lines began the cities or towns in India owed their existence to one of three reasons.—(1) They were either the capitals of Provinces, or venues for royal courts, or commercial centres situated along the inland trade route Embroidery work, fancy hand-weaving of cloth, etc., was carried on in these centres and costly textile manufactures were purchased by the State officials. These textile arts were not of a permanent character as they used to crumble down soon after the royal courts shifted from towns. This cloth production met only immediate requirements and fancy hand-made cloth had no steady market on account of its heavy price

The establishment of the East India Company led to the export of Indian hand-made cotton textiles to England in spite of the heavy duty which was imposed to safeguard the home trade. Naturally the textile craft was organized to supply the demand and the work was carried on through the formation of a guild During this period greater business contact was established between the East and the West, Western fashions made headway among the people, and new industries, like the cotton textile industry, arose, equipped with machinery on Western lines. Far-sighted business men began to give serious thought to this tendency.

During the earlier stages textile factories in India were not producing much cloth, but only yarn, and a large proportion of these coarse count yarns was exported to China and other Eastern markets. This trade went on profitably for about two decades but subsequently competition from Japan brought about a fall in Indian export. The mills were thus required to install weaving machinery for cloth production. In 1879 there were 125 spindles per loom and during 1927 this figure was reduced to 54 and during 1939 it has been further reduced to 50. This shows that a large amount of yarn is being consumed by the weaving industry

Early Looms

At first, the mills introduced narrow looms ranging from 24 ins. reed space to 44 ins. reed space for the production of narrow cloth such as shirtings of 26 ins. to 35 ins. width on an average. The cloth produced was plain grey as there were no arrangements for bleaching. Soon, the output of low quality cloth was given heavy size and calender effect was produced. Demand for it was great on account of its cheapness. Cotton mills took

this opportunity of supplying the country with cheap heavily sized calendered cloth. This variety made headway throughout India and led to the introduction of calender machines ranging from 3-bowl to 7-bowl, with or without friction arrangement, so as to give a glossy feel to the cloth. Damping equipments either along with the calender or separate damping machines equipped with water sprays for damping cloth before calendering, were introduced. The heavy size usually added on the warp yarn of these calendered goods ranged between 40 per cent, and 200 per cent., depending upon the requirements. Sizing materials other than the usual starches, weighters and softeners came into use for bringing whiteness, mellow feel and glossy effect on the cloth

The calendered goods trade was very popular during the early part of the twentieth century, but people began to understand that calendered goods contained material other than yarn and the price they paid was comparatively higher. The trend was towards a better class of fabrics. The cotton mills had to change their policy and at present one finds that very much less of calendered goods having 100 per cent. size are produced. Bengal, of course, has a large market still for calendered goods in *dhotis*, sarees and longcloth, but the percentage of size added to the material is on an average 60 per cent. and that, too, in medium counts. Generally speaking, heavy size calendered goods have practically died out nowadays and these have been replaced by better class fabrics.

The calendered goods trade was handled particularly by Ahmedabad, a big cloth producing centre in India, and even now the greater portion of this trade is handled in this centre. Ahmedabad-produced longcloths were of 20s warp and 30s weft with about 150 per cent. size and they were the best during the time they were produced.

Thus the closing part of the nineteenth century was known for varieties such as calendered longcloth, grey plain cloth, grey with coloured striped shirtings, and grey and calendered *dhotis* of narrow width, *mulmul* and *sarees* for Indian women in coarse and medium counts with small plain borders and very rarely with fancy borders. During this period power-looms were fitted with tappet motions for drill and twill, and a few dobbies for fancy work were installed. So the production of crepe, drill and twill also began to be undertaken.

Wider Looms and Combing Plants

Till about 1910 fancy work in weaving, the art of cloth-designing, high class dobby and jacquard work and the production of combed fine yarns were quite insignificant. During this period some new cotton mills sprang up with combing plants and looms of 52 ins reed space to 72 ins. reed space. Also some old mills underwent reconstruction. This resulted in high class fancy work in combed yarns ranging from 40s to 100s. The class of fabrics which was developed on account of the use of combed yarns was a superior



type of fancy shirtings having coloured threads, and high class Indian sarees and dhotis. This sort of superior manufacture necessitated the installation of modern bleaching and finishing machinery and a revolution in the hand bleaching process so far practised was brought about. Yarn and piece dyeing plants were also installed and a big range of cloth dyed in the piece and having much coloured yarn mixed with grey was manufactured. During the same period 40 shafts dobbies and jacquards were being introduced for the manufacture of coloured bed-sheets and chaddars and saree borders having big floral and geometrical designs and fast colours.

After 1920 artificial silk yarn came into use for the manufacture of union fabrics. Rayon yarn came into greater use by 1930 and many varieties of fabrics such as striped shirtings, artificial silk border *dhotis* and *sarees*, plain and fancy piecegoods having small and big dobby and jacquard designs were produced

It was during this period that the sizing of rayon and its processing through winding, warping and sizing, became a problem for the technical staff and various easy and economical methods for tensioning and control of this rayon yarn were devised. The sizing of artificial silk yarn is carried out in the form of hanks mostly by the use of gelatine glue or gum or a mixture of both. Many special sizing materials for artificial silk yarn are on the market but still glue holds its own against all these substances so far as efficient sizing is concerned. The sized artificial silk yarn is wound in the same way as cotton yarn on the warpers' bobbins from hanks and warped also in the same way as cotton yarn. It being sized previously the warpers' beam containing artificial silk is placed in front of the sizing machine and mixed with cotton threads in the wraith along with sized cotton yarn as per pattern. The method of mixing this artificial yarn with cotton yarn in the wraith requires careful displacing as per pattern so that the art silk threads may not be slack or tight during weaving. Separate art silk beams are also taken out for looms, especially for saree borders, etc., and where it is thought advisable to do so. The mixed piecegoods woven with cotton and artificial silk yarn is piece-dyed, or, coloured threads of both are used as lines in bleached sorts. These mixed fabrics to-day form a substantial portion of the entire cloth production.

During 1927-28 the import of artificial silk yarn in India was about 80 lakhs lbs. This rose to $3\frac{1}{2}$ crore lbs. during 1937-38. During 1938-39 it was about $1\frac{1}{2}$ crore lbs. So on an average during normal times India imports about $2\frac{1}{2}$ crore lbs. of rayon yarn for the production of union fabrics.

Very recently the Technological Laboratory of the Indian Central Cotton Committee has started investigations for the manufacture of chemical cotton, and with the co-operation of the Government of Bombay there is the possibility of manufacturing artificial silk in future.

There is a large quantity of surplus short-staple and lint cotton available in this country for conversion into artificial silk and staple fibre the consumption of which is about $2\frac{1}{2}$ crores to 3 crore lbs. yearly, as stated above.

Use of Fancy Yarns

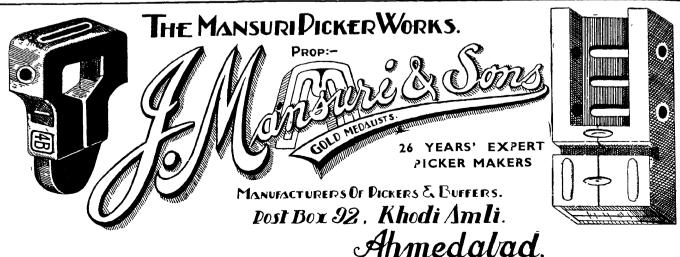
After 1920 fancy yarns began to be used in the cloth, and grandrelle yarns were the first to be seen in coatings and shirtings. The progress in the direction of using fancy yarns such as grandrelle yarns, looped yarns, slub yarns, corkscrew yarns, chain yarns, snarl yarns, union yarns, etc., has been very great and many mills have installed fancy yarn doubling machines.

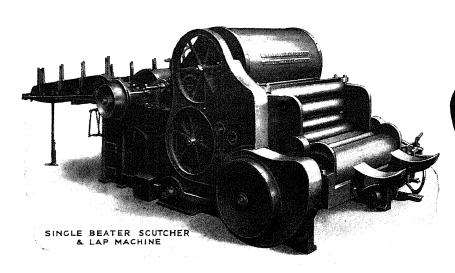
The introduction of combing plants in India during 1928-32 on a very large scale, especially in Ahmedabad, led to a large portion of the *dhoti* trade, which was in the hands of Lancashire, being captured, and the *saree* trade being developed to its highest pitch, using artistic skill in the designs produced by dobbies and jacquards. An increased quantity of Egyptian and African cottons is used, without, however, affecting the consumption of Indian cottons, these being consumed in mills constructed for coarse counts elsewhere in India.

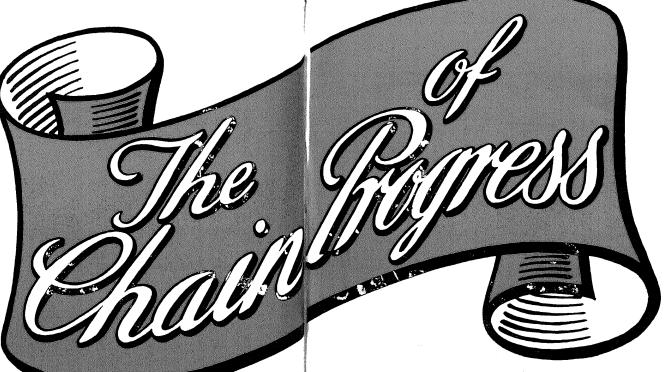
In the weaving trade the introduction of the latest type of machinery during the last two decades has also played a very important part in keeping the technicians alert about the quality of yarn and its processing through winding and warping for good weaving. The increasing use of high speed winding and warping machines and automatic looms has brought about changes in cloth production methods.

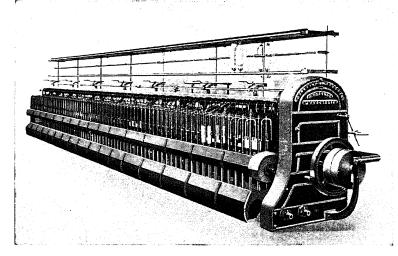
Thus it will be seen that during fifty years of progress, the beginning was made by narrow-width looms producing plain grey and calendered cloth having 200 per cent. of maximum heavy size The second stage was the introduction of medium quality goods, fancy and fine goods requiring combed yarns. These goods were produced with the aid of dobbies and jacquards. This necessitated wider looms and big dyeing and bleaching plants. The third stage was the introduction of artificial silk yarn and fancy yarns in the manufacture of high class goods and now the fourth stage is the slow introduction of automatic looms which will lead to a revolution in the methods of manufacture, type of cloth and management.

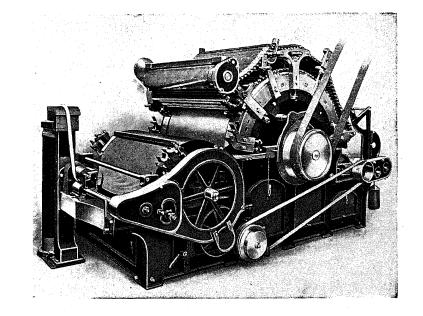
Thus Indian textile manufacturers have always looked to the requirements of the country and varied the production of cloth to suit the tastes of the people. They have also not lagged behind foreign competitors. At present the stage has been set for producing all the clothing requirements of India. It remains now for the industrialists and technicians to march forward inventing new and improving old machinery and processes so that a bold bid can be made for India's legitimate share in the world markets for cotton piecegoods.







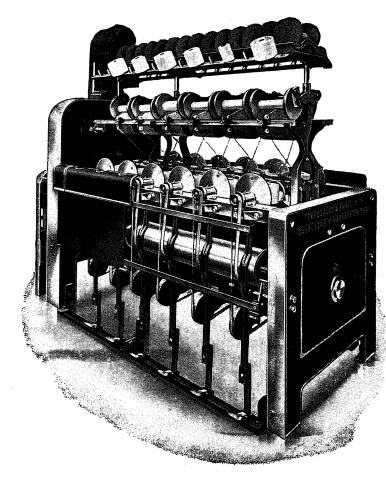


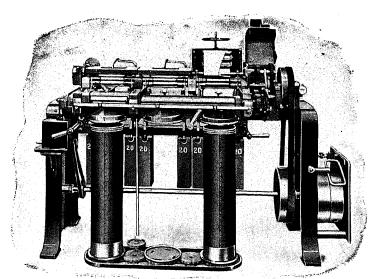


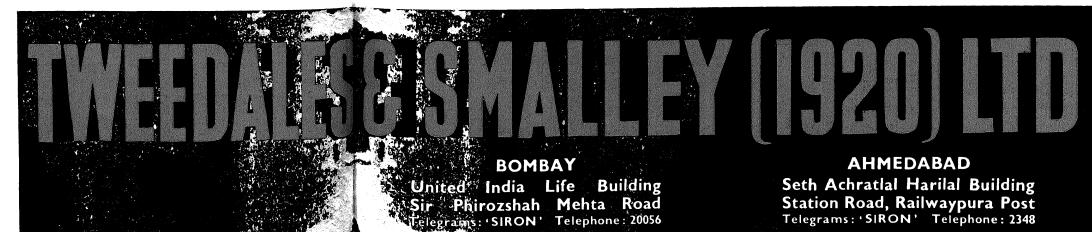
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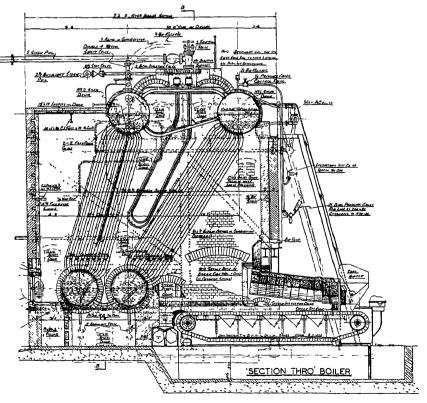
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FIFTY YEARS OF ROPE DRIVING

By

JOHN LEIGH

TT is doubtful if there is any commodity which has been more essential to progress and growth than ropes, and this fact has made most people in some way conversant with the method of rope driving But a revolutionary change has occurred in the last fifty years.

One can trace the use of ropes as a means of power transmission even in the dim past. The ropes used in early industrial applications were crudely constructed and manufactured from hard fibres, such as hemp and even coir. It was, however, soon realized that, due to the harshness of these fibres, the ropes soon wore out, permanent stretch occurred at a rapid rate, and, owing to lack of elasticity, rope life was far from satisfactory. The wearing of pulley grooves also proved to be a source of trouble and expense.

The problem of finding an effective substitute was taken up by the spinners of Lancashire a little more than 50 years ago and it was soon found that cotton was a vastly superior and more economic material

Nowadays the great majority of driving ropes used throughout the world are of cotton.

At first there was room for improvement in the methods of constructing ropes for the special requirements of power transmission. Experiments were made in varying the numbers of strands and eventually it was found that the three-strand rope gave the best results over a very wide field of use.

The selection of a suitable type of driving rope is the first and most important factor in ensuring ropedrive satisfaction. It is obviously inefficient and uneconomic to put cheap or unsuitable ropes on a well designed drive, just as it is wasteful of good ropes to use them on a badly arranged one. When bad conditions must be endured special consideration is necessary to avoid unnecessary waste but, other things being equal, the best quality rope is always found to justify its cost.

In India rope-splicing is of very special importance. It is safe to say that much power, production and rope could be saved by more attention to splicing. The leading rope makers will always be found ready to help by supplying detailed instructions for making splices; specimens and diagrams sometimes being freely available.

Important Points

The following points should be looked for in a good transmission rope :-

A correctly constructed rope is built up solidly in such a manner that every yarn in the rope contributes its full share towards bearing any load. There should be uniform construction throughout the entire cross section; some ropes consist of a loose mass of yarn underneath the surface threads and these ropes fail rapidly after the surface is worn away. Perfect yarns, not "rejects," of uniform counts and direction of twist must be used. There should be no sign of "crinkling" in the inner threads, and the rope should be uniform in lay and diameter throughout its entire length. Beware especially of irregular "walk-made" ropes which inevitably have "soft" ends at frequent intervals.

The life and efficiency of a rope drive depend on the uniform distribution of load among all ropes Unless the ropes are uniform in diameter, twist and lay, this is ımpossible

Driving ropes should be lubricated not only on the surface of the rope but between the strands, but the practice of some rope-makers of loading ropes heavily with so-called "dressing" should be discouraged.

There have been immense developments in the design of rope drives, during the past 20 years. Due to the advent of high speed turbine, the frequent limitation of space available, and the popularity of electric motors for individual machines or group driving, it has been necessary to revise the whole outlook of rope drive design. The old principles and formulæ derived from the early development of industrial driving based on the reciprocating steam-engine are now inadequate, and a fresh technical and economic basis has had to be found for the satisfactory design of both main drives and counter drives.

During the last fifteen years there has also been a most valuable and important development in the application of rope driving to ring spinning frames, doubling frames and similar types of machines. This type of drive was first made practicable by the invention of "fast and loose "rope pulleys. This invention made available the advantages of rope driving to spinning frames at low cost, and for many applications the "fast and loose" rope pulley drive functions very satisfactorily. For many years, however, experiments were carried out with various types of friction clutch. For heavy frames and for fine spinning the F. and L. pulley drive has serious limitations.

The Adjustable Gallows Pulley Bracket is a much appreciated recent development in modern rope drives as applied to textile frame rope drives. For safe and ideal service these brackets should enable universal adjustment to be made of the pulleys which should be as close together as possible. The entire bracket should be light, compact and rigid, and adequate simple tensioning adjustment must be provided.

Short-Centre Rope Drives-A Warning

The development of the simple, robust and efficient electric motor has been of enormous value to the textile industries. Rope driving has rapidly been adapted to provide a satisfactory medium from such motors to shafts and machines, often at high ratios and short centres. In fact, short-centre high-speed rope driving both with Vee ropes and specially designed round cotton ropes has been of inestimable service to textile mills in recent years. Drives—the design of which would have been considered impossible ten years ago-have become a satisfactory commonplace. Ancient prejudice against the use of small ropes and short centre distances has been overcome by the enterprise and research of firms who have approached these modern transmission problems in a broad engineering spirit and not cramped by any narrow traditional trade (Continued on p. 231)



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POWER TRANSMISSION BY FLAT BELTS AND "V" ROPES

В

S. B. HAINSWORTH, A.T.I.

To is not generally realized how efficiently power can be transmitted by means of flat belts or "V" ropes. Beltings for the transmission of power have been used over so long a period that some engineers have now come to regard them as being "out of date." Nothing could be farther from the truth. If power users were being asked even to use the beltings which were being manufactured in the early nineteen twenties there would be some justification for stating that other methods of transmission had outstripped them. During the last few years such tremendous advances have been made that it is worthwhile to try and give some explanation of what is being done in certain fields.

At one time belting manufacturers were in the habit of fixing up any drive which came their way. To-day, reputable firms will not consider the installation of their beltings on drives which are, in their opinion, unsuitable. The consequence is that flat belting is, to a very large extent, recovering its old place and is being used more and more by engineers who appreciate the special qualities which it possesses.

Much the same thing applies to " $\mbox{\sc V}$ " ropes. No "V" rope manufacturer of repute would recommend that one of his drives should be installed on a unit where the rope speed is low. In such a case he would unhesitatingly recommend that chains or gears be employed. Again, no "V" rope manufacturer would recommend that his ropes be installed on drives where the peripheral speed was in excess of 5,000 to 5,500 f.p.m. In such cases he would recommend that flat belts be installed. These developments are all to the good, because they ensure that the buyer of power transmitting equipment shall get reasonable efficiency from the material which he purchases The old days when every drive was tackled, irrespective of whether or not it was suitable, are gone, and the result is that each medium is carving out a field for itself where it maintains a definite supremacy.

Electrification has given the manufacturers of flat beltings many new problems to face. In part, these have been met by the introduction of endless "V" ropes. Another important development is that of the pivot-base type of drive, where an electric motor is mounted upon a self-tensioning device, which ensures that users shall have the minimum amount of time and attention to devote to their drives. Pivot-bases can be used with either flat belts or "V" ropes and, under certain conditions, are a very valuable addition to the list of power transmitting appliances available.

It is the purpose of this article to consider the "V" rope and belting fields, survey the types of flat beltings which are available, and to give particular attention to one of the most successful developments of recent years—the rubberized solid woven belt accompanied, or unaccompanied, by a special base weave.

"V" Ropes

These have their ideal field of application at speeds between 2,500 and 4,500 f.p.m., particularly where

centre distances are short. Above 8 or 10 ft centres, flat belts or element ropes are used. "V" ropes work at short centres, protect motors, are clean, quiet and run at low tensions "V" flat drives from "V" to flat pulleys are suitable for speed ratios of 3.1 and over with existing flat pulleys, but greater loads are imposed on bearings and more frequent attention is needed

Flat Belts

These still transmit the greatest amount of power in all countries, and will probably continue to do so for a long time. Admittedly, increasing motorization, using the word as covering electric motors, has created a new power transmission problem, because it is now possible to close-couple machine and power. The new demand is being catered for by "V" ropes, chains, gears and pivot-base drives, but there is an enormous amount of machinery which can still be most conveniently and economically driven, and probably will continue to be driven, by flat belts. For ordinary everyday use in factory and workshop, flexibility of application and wide range of advantages make flat belting and "V" ropes in greatest demand for the majority of drives. Flat belts possess a most useful protective capacity; they can stop and start machinery easily by means of forks, and, by pulley changes, driven speeds can be quickly and easily varied. Flat belts are suitable for medium and high speeds, wide range of centres, are low in first cost, and have the ability to work on almost any drive, giving the idea that they are foolproof. The modern beltdriven factory, equipped with ball or roller bearing lineshafting, flat and "V" rope drives that have been chosen for efficiency rather than price, and group drives with heavy lineshaft pulleys where loads fluctuate, is a unit that is in a good position to use power wisely. It is important to bear in mind that in the case of flat belt drives with long horizontal centres there is a certain self-adjusting capacity present, due to the fact that, under load, the belt extends and the amount of belt in contact with the pulleys is increased. This selfadjustment is not present to any appreciable extent in short centre drives. With short centre drives stretch (even if only the same percentage as in a belt on a longer drive) affects the tension, and necessitates earlier taking

Consideration of Driving Conditions

In view of the enormous amount of flat belting which is used to transmit power, the lack of thought given to drives by machine makers, and also by actual users, is amazing. There are many large factories who have a "belt man" who is merely a semi-skilled mechanic. The buyer of belting descends to the trial and error system, a particularly expensive one, and unfair comparisons are made due to widely differing drive conditions. There are certain experimental results which concern the reasons for flat belt failure. It is found that the breakup of a belt is influenced by speed only to a small extent, but that a reduction in pulley diameters

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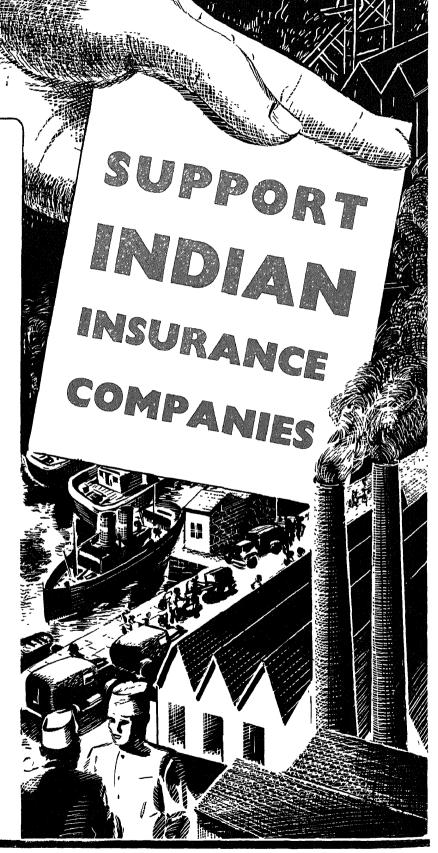
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from a normal recommended minimum of, say, 10 ins. down to 5 ins will reduce belt life from 10 years down to 8 months. A reduction in the tension of a fully loaded belt (tight side) from, say, 100 down to 90 lbs. per 1 in. of width will increase belt life from two years to three years. If small pulleys are used, belt tensions must be reduced. That is why large pulleys and low tensions are advocated. Flat belt drives need to be designed as scientifically as "V" rope drives. It is now possible to put good belt makers into the position of unpaid (largely) consulting engineers and, having decided to take this advantage, the type of flat belt for any drive can be chosen

(1) Leather

Leather, as the oldest and best known of all flat beltings, must be mentioned first. Yet, in spite of its age, considerable advances in the manufacture of leather beltings have taken place in the last 10 years. Such beltings are now wet-stretched before cutting up, are supplied with waterproof—really waterproof—cement at the joints, and are finally given a period under running conditions to fit them for use. It is commonly argued against leather belting that it is not so straight running as textile belting, and whilst this argument has some validity, as a leather belt is composed of a number of strips as against the continuous textile belt, the point may be over-stressed. In practice, good leather belts, although not so uniform as textile belts, have their differences in strips cancelled out over a belt length.

(2) Solid Woven Beltings

Solid woven beltings are manufactured in looms which weave the whole belt at one operation, and there is no reliance placed upon adhesion between plies as is the case with other types of fabric belting.

The history of the development of the weaves used in solid woven beltings is interesting. In the first place, a plain weave was used composed of 2, 3, 4, 5 or 6 plies of rather open fabric and bound together by warp binding threads which passed through from top to bottom.

Another type of weave which has been used for a long time is the one where a three-ply construction is the base with self-binding taking place from the top to the centre and the bottom to the centre layers respectively. This weave gives an extremely flexible but rather soft type of belting.

The twill weave—a two-ply construction with two and two, or two and one, twill top and bottom bound by warp threads passing through in a "V" shaped track—has been employed for many years. This provides a good, sound, strong belt of enormous tensile strength, owing to the tremendous amount of warp used, but, unfortunately, it is limited to a thickness of about $6\frac{1}{2}$ mm. It is only during recent years that the development of patented weaves has enabled this type of construction to be made three-ply, with the consequence that a sounder job is made and belts thicker than $6\frac{1}{2}$ mm. can be produced.

The most important development in the weaving of textile beltings which has taken place for a long time is a design, fully patented, in which advantage has been taken of the latest developments in the art of weaving, and, as a consequence, it has been possible to produce a fabric which, it is claimed, is better in every respect (from a transmission point of view) than anything previously produced. The belting is so woven that the strength is concentrated at the pitch line where the belt

should neither extend nor contract when passing over pulleys, and the layers on either side are so tensioned that they are suitable for the loadings which come on them. The "pitch line" layer is more closely woven than any of the others, and is therefore stronger (whilst taking up less space) much more resistant to the tearing action of belt fasteners, and less liable to extend when put under tension. The layer which runs next to the pulley is so tensioned that it carries none of the driving load, and is so woven that it produces a "suction face" which has been proved, by laboratory and works tests and on drives all over the world, to transmit more power than the ordinary type of belt face. The interlacings for the binding threads are novel and new. Instead of the binding threads all weaving the same way, they have been divided into sections, and some of them are used to bind together the three load-carrying layers, whilst at the same time they are allowed to interlace with the pitch-line layer, so producing a hinge which adds to the flexibility of the belting and making additional interlacings to prevent fasteners pulling out. The other set of binders interlaces only between the top face of the belt and the first load-carrying layer. Therefore, for the first time in any woven belting it is possible to wear away the first layer completely without damaging the base structure. This type of belting has proved to be tremendously successful, and it has, to quite a considerable extent, replaced the older types.

Nothing has done so much to bring solid woven beltings into prominence as the comparatively recent invention of processes which enable rubberizing to be carried out. Prior to the introduction of rubberizing processes solid woven belts were either impregnated with bitumen or an oil compound or a mixture of both, sometimes impregnated with a linseed oil base mixture and subsequently painted with red paint, or occasionally treated with paint only. Bitumen, whilst protecting fibres from damage by moisture or other adverse influences, has very little binding power, and linseed oil mixtures, although excellent in their way, have a tendency, in time, to damage cotton fibres; furthermore, such oils, if applied in sufficient quantities to really bind the fibres of the belting together, make it extremely hard and inflexible. It had been obvious for a number of years that the belting world was waiting for the invention of some process which would enable solid woven beltings to be treated with rubber in the same way as the rubber and canvas ply type belts which have been on the market for so long.

The invention came, and the first solid woven beltings to be successfully manufactured with rubber as a binding material were marketed under the general heading of '' Z '' belts. The process of impregnation was fully patented, and the results achieved have considerably exceeded the expectations of those who originally devised and introduced the new product. By this process closely woven beltings can be completely and thoroughly treated with rubber in such a way that a compact structure, tremendously strong and flexible, is manufactured. This rubberizing process protects the belting against the effects of heat, steam, water, acids and alkalies. Furthermore, it has the advantage that by its use the coefficient of friction between the belting so treated and the pulleys over which it passes is considerably increased, and National Physical Laboratory tests show that more power can be transmitted by this belting than by other types. The compound of cotton and rubber is so tough that fasteners are extremely well held, and the old complaint against solid woven beltings to the (Continued on p. 243)

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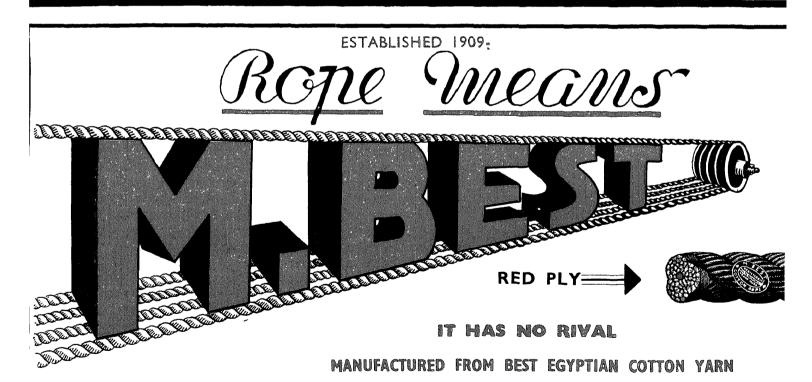
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G. D. SOMANI

THE Indian textile industry is the premier national I industry of this country which is mainly controlled. manned and financed by the nationals of India and which occupies a very important place in the national economy of this country. The industry represents a capital investment of about one hundred crores of rupees, gives employment to about four and a half lakhs of workers and consumes about three and a quarter million bales of Indian cotton annually. The early growth and expansion of this industry occurred in Bombay, and although during the last two decades textile mills have sprung up in several other parts of the country, even to-day the Bombay Presidency produces about 70 per cent. of the total cloth produced in India. There are 389 mills with about 10 million spindles and 200,000 looms. About 60 per cent. of the spindles and 70 per cent. of the looms are located in the Province of Bombay, the actual figures being 6 million spindles and 141,000 looms. About half of these, i.e., 2,850,000 spindles and 67,000 looms are in the City and Island of Bombay. Ahmedabad, which is the other large centre of the industry in the Province of Bombay, has nearly 2 million spindles and about 48,000 looms. The vital part which the textile industry thus plays in the economic life of this Province cannot be too strongly emphasized and, indeed, as the Noyce Tariff Board observed, the prosperity of Bombay Presidency is bound up with the textile industry. Bombay is rightly regarded as the pioneer of this industry and the predominant position which Bombay occupied in this field continued unchallenged till about 1923. Since that year the Bombay mills have been steadily losing ground and the comparative position of the Bombay mills in relation to the whole country in 1927 and in 1939 is worth illustrating. I propose to deal only with the mills situated in the City of Bombay and Island and not in the whole Bombay Presidency, and hence the figures relate only to Bombay City and Island.

Bombay City and Island.

$All\ Ii$	ndıa.
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		No of Mılls	Average working		No of	Average working	
			Spindles	Looms	Mılls	Spindles	Looms
1927	•••	83	29,51,513	69,684	336	75,21,636	1,46,200
1939	• •	68	24,84,022	61,452	389	89,86,371	1,83,332

The expansion of the industry in other parts of India was natural since it was only logical to expect that with the growing desire of the nationals of this country to make India self-sufficient in the field of her textile requirements, other Provinces should also take their due share in the growth of the industry. There would have been no legitimate ground for Bombay to complain if the position of the industry here had remained intact and if the growth of the mills elsewhere had not been to some extent at the expense of Bombay mills. But from the point of view of the Bombay Presidency, the most disquieting feature of this rapid expansion of industry in other centres has been that while the industry in other

places has been expanding and flourishing, Bombay mills have not only been unable to hold their own but have been continually losing ground year after year. In the last decade there was a marked tendency for the migration of the textile industry from this city to other centres of the country. The pace and extent of such migration may not have been alarming so far, but the forces that are operating at present are gaining ground and unless adequate steps are taken in time to remedy this unhealthy situation, this migration is bound to destroy the entire economic structure of this Province in the long run

In spite, however, of adverse factors, there is no need for pessimism if only Government, the millowners and the general public will realize the situation in its true perspective and take timely steps to meet it. There are certain advantages for Bombay mills such as abundance of credit facilities, cheap and speedy transport and shipping facilities, scope for fine and fancy goods, etc., which, if properly developed, can yet turn the tide in their favour.

Export Trade

With a very large home market, the Indian cotton mill industry has not so far taken any vital interest in overseas markets, but the importance of these markets to Bombay mills now is quite obvious. If Bombay mills are able to send a portion of their products overseas, it will give a real fillip to the whole industry. The potentialities of the export market should, therefore, be thoroughly examined The war has changed the whole outlook of the export trade, and there are indeed very bright chances at present for the Bombay mills to build the export trade. It is satisfactory to note that the Millowners' Association, Bombay, is leaving no stone unturned to seize this opportunity for expanding exports, but it is for the Government of India to arrange all possible facilities in this direction. One important concession, if the Government of India allows it, will go a long way to push the export trade. The heavy duty on imports of foreign cotton is against all sound principles of taxation but Government can make it somewhat less irksome by introducing a system of customs drawbacks under which the duty on all imported raw materials would be refunded on all goods meant for export abroad. This concession will give the much needed fillip to the export trade at a time when the chances of expanding overseas markets are bright.

Labour Problem

It must be recognized that Bombay mills are working under crushing burdens of labour charges. The main report of the Bombay Textile Labour Inquiry Committee has still not seen the light of day, but it is inconceivable that the Bombay Government will choose to impose any further burdens on an already over-burdened industry. All commercial organizations are unanimously pressing for a uniform policy in labour legislation such as sickness insurance and leave with pay, and it is to be hoped that Provincial Governments will leave such matters to take an all-India shape.

(Continued on p. 239)

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A PREMIER MILLOWNERS' ORGANIZATION

Ву

T. MALONEY, M.C., A.M.C.T.

Secretary, The Millowners' Association, Bombay

THE Millowners' Association, Bombay, was established in 1875 Lancashire was disturbed at the pace at which the infant Indian cotton industry was developing, and their agitation to secure the removal of the 5 per cent import duty on coarse cloth which had been imposed as a revenue measure, alarmed the few leading Bombay millowners of the day, and they formed themselves into an association for the purpose of safeguarding their interests. Sir Dinshaw Petit, Seth Morarjı Goculdas and John Gordon, the then Secretary of the Chamber of Commerce, were the chief inspirers of the movement. The preliminaries connected with the inauguration of the Association were completed in February 1875 and the secretarial work of the Association was entrusted into the hands of the Bombay Chamber of Commerce, the Secretary of the Chamber also acting as the Secretary of the Association Mr. Maxwell became the first President. He was followed by Mr. J A Forbes and Sir Dinshaw Petit, the last mentioned holding office for a record period of 11 years. Since then, the Association has had a long line of illustrious chairmen who have made their mark not only as industrialists and business men, but in many other spheres. The Chamber of Commerce continued to be responsible for the secretarial work of the Association till the end of 1923, but, in view of the enormous increase which had taken place in the work of the Association, it was decided to form a separate organization with a full-time secretary and staff, and Mr. Maloney became the first Secretary of the Association in 1924.

The Activities of the Association

The Association has an all-India membership and controls about 50 per cent of the country's active spindle-age and loomage. The affairs of the Association are managed by a Committee of 20 persons including a Chairman and Deputy Chairman, who hold office for a year only, but are eligible for re-election. In broad outline, the activities of the Association are:

- (1) Protection of the industry's interests by promoting, supporting or opposing all legislative and other measures which affect the trade, commerce and manufactures of its members.
- (2) Initiation of measures for the progressive development of the industry and reduction of production costs.
- (3) Concerted action by members on matters affecting general policy.
- (4) Registration of trade marks, trade numbers and trade names, of members.
- (5) Collection and distribution of statistics concerning the Indian textile industry in general and the Bombay industry in particular
- (6) Collection and dissemination of information relating to the textile trade of other countries.

The efforts made by Lancashire interests to strangle the Indian cotton industry culminated in the notorious Cotton Duties Act of 1896 which imposed a $3\frac{1}{2}$ per cent. Excise Duty on every pound of cloth manufactured in

cotton mills. The imposition of this duty, which penalized the right of every citizen to spin yarn and to weave it into cloth, evoked country-wide protest and, though condemned in no uncertain language by all shades of public opinion, the duty continued to be imposed till December 1925, when it was suspended by an Ordinance issued by His Excellency the Viceroy and abolished later To the Association goes the credit for this achievement. The abolition of the Excise Duty was one of the major problems tackled by the Association immediately after its separation from the Bombay Chamber, and Mr S. D. Saklatvala, the then Chairman of the Association, was unremitting in his efforts. The press and the public saw the equity of the demand for the abolition of the duty and a resolution asking for the repeal of the duty was passed by the Assembly, but Government were still adamant. Sir Ness Wadia who succeeded Mr Saklatvala as Chairman kept up the pressure. He personally placed the millowners' case before the British public and the Secretary of State for India In the meantime conditions in the industry deteriorated and, to effect a saving in production cost, the Association notified a reduction of about 10 per cent. in the wages of the operatives. This precipitated a general strike in Bombay which was settled through the good offices of His Excellency the Governor of Bombay, the Association agreeing to waive the proposed cut if the Government of India abolished the Excise Duty This was followed by an Ordinance suspending the duty.

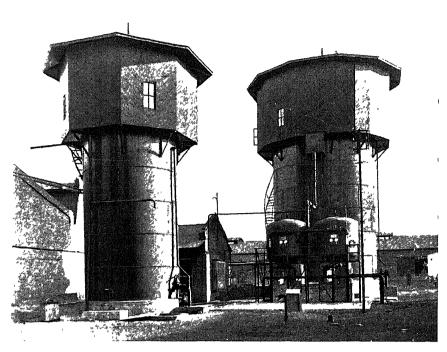
Efforts To Secure Protection

With the Excise Duty out of the way, the Association concentrated on securing protection to the industry against foreign competition. After very protracted negotiations in which much valuable time was lost, Government appointed a Tariff Board to consider the industry's case for protection against Japanese competition. Even then it was not smooth sailing, and the small measure of relief recommended by the Board was not accepted by Government for very flimsy reasons. Then followed a series of letters exchanged between the Government of India and the Association, deputations and interviews in which the Association emphasized the need of Government reconsidering the decision on the Board's recommendation. In this, it succeeded and at last Government introduced a Bill in the Assembly to provide for a minimum specific duty of $l\frac{1}{2}$ annas per pound on imported yarn. The subsequent history of Indian cotton tariff is well known and needs no repetition. Suffice it to say that within a short period of four years, the duty on cotton piecegoods was raised very substantially and enabled the industry to survive in Bombay and to expand in other parts of India.

It was again the Association which was responsible for securing valuable and substantial reductions in power costs from power companies. The Association fought out a test case in the Small Causes Court and obtained a reduction in municipal assessment for its



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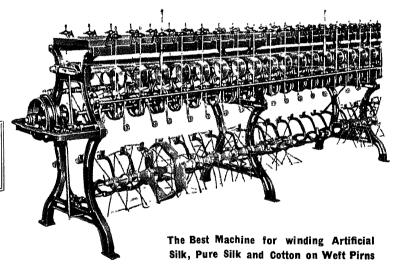
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member mills. In the field of insurance, the Association was successful in obtaining reductions in fire insurance rates; and its subsidiary, the Millowners' Mutual Insurance Association Ltd, has been able to undertake workmen's compensation insurance at rates which are less than half those which the insurance companies offered when the Workmen's Compensation Act first came into force.

The recommendations made by the Association on important questions of policy are accepted and carried out by its members. The dear food allowances, bonuses, etc., granted to workers in the years 1917 to 1922 emanated from the Association; the minimum wage schedule formulated by the Association in the middle of 1934 evolved order out of chaos and guaranteed to workers fair wages. It was again the Association's recommendations which led up to Bombay mills paying the interim recommendations of the Bombay Textile Labour Inquiry Committee.

Contracts for the sale of goods entered into by Bombay members of the Association are made out on the Standard Contract Form drawn up by the Association, which contains a provision that all disputes arising from such contracts should be referred to arbitration under the Association's Arbitration Rules.

Attitude to Labour

The efforts made by the Association to give the workers in the industry a fair deal requires special mention. A labour code, setting forth conditions of work, was introduced in member mills as far back as 1930. This code gave effect to certain important provisions of the Payment of Wages Act and the Bombay Industrial Disputes Act, long before these two Acts were passed, and has since been copied by other employers and other industries in various parts of India The Association has standardized the procedure to be adopted in connection with the employment of substitute labour, grant of leave, discharge, suspension, dismissal, etc., in member mills. More time is being devoted to-day than ever before in the history of the Association to labour matters, and the Labour Officers of the Association who act as liaison officers between the Association and its individual members on all labour matters are the friends and advisers of employers as well as employees.

A number of mills have, at the instance of the Association, appointed Labour Officers whose functions are: to attend to the grievances of workers in their respective mills and to set matters right wherever necessary; to ensure that the labour recommendations made by the Association are carried out, and to ensure the strict observance of the provisions of the Association's Standing Orders, the Bombay Industrial Disputes Act, the Bombay Maternity Benefits Act, the Payment of Wages Act, the Factories Act, the Bombay Shops and Establishments Act, etc., etc. The Labour Officers of individual mills regularly meet in the rooms of the Association and difficulties, if any, experienced by them in dealing with particular problems are discussed The Association has also a special sub-committee consisting of mill managers which meet very regularly to advise the General Committee of the Association on technical and labour matters. Following the rise in commodity prices which took place towards the end of 1939 as a result of the war, the Association decided to open costprice grain shops in individual mills to protect employees against the rising prices. The grain shops commenced to work in January 1940 and to-day there are 44 mill grain shops. These shops stock the commodities listed by the Association and sell them at the rates fixed by the Association The Association also controls the quality of the grains, etc., sold in these shops and also scrutinizes their working results. In addition to grain shops, a considerable number of mills have, on the recommendations of the Association, opened canteens where good quality tea and eatables are supplied at cheap rates

Another matter in which the Association has been of service to its members is in respect of the registration of trade marks, trade numbers and trade names. The scheme for the registration of trade marks which was put into operation in 1886 has, in the absence of a Trade Marks law in India, been of very great use to all member mills not only in protecting their most important trade marks, but also in preventing unintentional infringements. In 1933, the Association introduced a scheme for the registration of trade numbers, and this was followed up in 1935 by a scheme for the registration of trade names.

Bombay being the principal centre of the Indian cotton mill industry, the Association has taken a leading part in inquiries conducted by Tariff Boards and Commissions and Committees appointed by the Government of India and the Government of Bombay. Besides representing the industry before the Tariff Boards which were appointed in 1926, 1932 and 1935, the Association fought out the case of its Bombay members before the Fawcett Inquiry Committee (1928-29), the Pearson Inquiry Committee (1929) and the Bombay Textile Labour Inquiry Committee (1937-40).

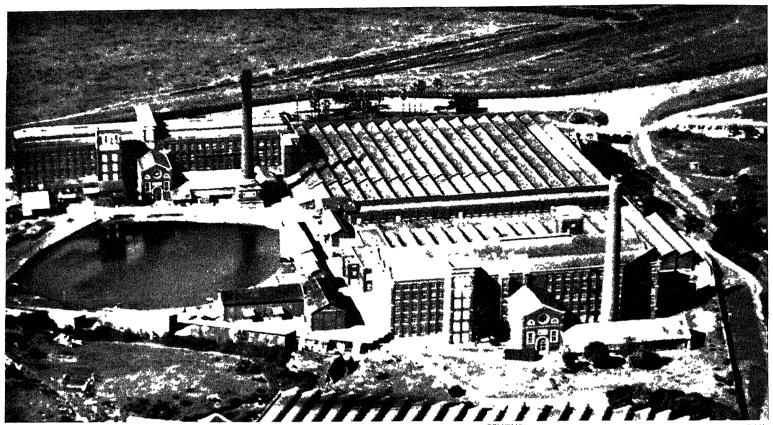
Trade Policy

The Association has adopted a forward policy in regard to the home and export trade of its members. In 1927, it co-operated with the Government in sending out a Trade Mission to Africa and the Middle East, and a sum of about Rs. 20,000, from the funds of the Association, was spent upon it. Information relating to the manufactures of member mills has been compiled in a publication published in 1931 entitled "Where to Buy Indian Piecegoods and Yarn," and a large number of copies of this booklet was distributed free of charge all over the world. The popularity of this publication may be gauged by the fact that a fourth edition will shortly be published. The numerous inquiries constantly received from overseas are systematically investigated and followed up, and as a result a number of member mills have built up valuable connections in Africa, the Middle East and the Far East. In 1933, the Association financed a private Trade Mission to Ceylon and the information brought back by this Mission proved useful to members in pushing their sales in the Ceylon market. The home market has by no means been neglected and a number of publicity schemes have been organized from time to time A special exhibition train was chartered in 1930. This train covered some of the most important cloth consuming centres of India and about 40 leading mills participated in it. Until recently very few member mills were direct sellers in up-country centres, business being concentrated in the hands of Bombay dealers, a position which was not altogether satisfactory, but to-day almost every mill has a network of sellers all over India.

The statistical branch of the Association is a live organization, and the data collected and codified by it have been useful in proving the industry's case before several Tariff Boards and Committees of Inquiry, and the value of the Association's statistical records has (Continued on p. 219)

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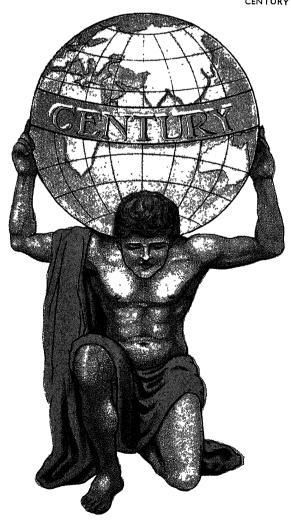
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COTTON SPINNING IN SOUTH INDIA

ву J. M. DOAK

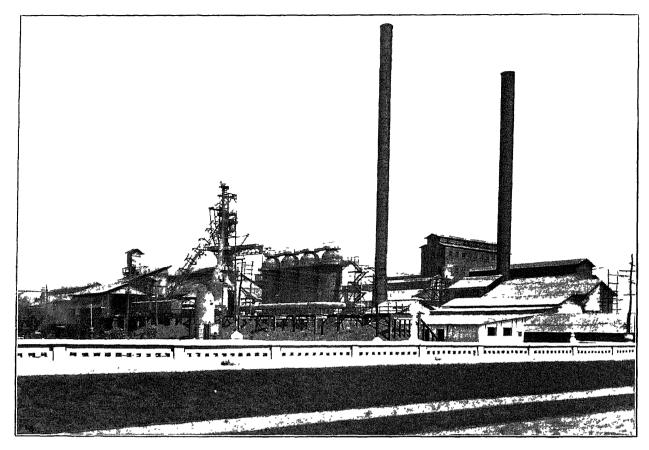
OUTHERN INDIA to-day has a large spinning industry, situated mainly in the Coimbatore, Madura and Tinnevelly Districts of the Madras Presidency There is, of course, the well-known Buckingham and Carnatic Company in Madras City, but as it is entirely a producer of cloth, it is outside the scope of our subject

It is interesting to go through old records and see the beginnings of things. In 1869, Lord Napier, Governor of Madras, in spite of the apathy of the Council of his day, had the vision to comment on the suitability of certain districts for the development of cotton spinning He sent M Duval, a French Engineer, to report on the possibilities of the Papanasam Falls, near Ambasamudram in the Tinnevelly District. M Duval reported: "... My return journey by land was very tedious and difficult. I encountered the most fearful weather incessantly, and received a violent wind-stroke, which forced me to remain some days at Kytar; moreover, the roads were well-nigh impracticable . . . " However, in spite of his "wind-stroke" he reported favourably on the prospects of a spinning mill to be run by water-power and thereafter Lord Napier, in an excellent minute, gave his opinion that three natural centres existed, where the cotton industry should be fostered. These, he said, were Papanasam, already mentioned, Coimbatore and Bellary. In his minute, Lord Napier disposed of the arguments which might be brought forward against his proposals, namely, that it was not the duty of Government to co-operate in the introduction of any branch of industry, and that the development of cotton manufactures here would be detrimental to the interest of Great Britain. Here are his own words-far-seeing and wise, written as they were in 1869 . "The increase of cotton manufactures in India would undoubtedly tend to restrict importations of the same articles from England; but we are not to be deterred by this consideration from giving free scope to all the natural facilities for manufacturing industry which India possesses. India is a valuable market for English manufactures, and in the interest of the great mass of consumers themselves, that market should not be limited by artificial obstructions, such as high tariffs; but India is not a preserve for Manchester, and the Government and people of England would repudiate a calculated neglect of the industrial capacities of the country "

For a time Lord Napier's words fell on infertile soil. "The man on the spot," in the form of the Madras Chamber of Commerce, waxed sarcastic at His Excellency's expense and nothing was done until 10 years later. In 1880 Messrs Andrew and Frank Harvey, founders of the firm of A. and F. Harvey, examined the possibilities of the Falls at Papanasam, and greatly daring, formed the Tinnevelly Mills Co., Ltd. Pipe-lines, machinery, materials of all sorts were transported by bullock-cart some 25 miles over rough tracks, and by 1881 the first spindles were in operation. The enterprise was successful, and Messrs. A. and F. Harvey thereafter formed the Coral Mills Co., Ltd., in Tuticorin and the Madura Mills Co., Ltd., in Madura in 1887 and 1889 respectively. Incidentally, all three are now

included in the Madura Mills Co., Ltd. The man on the spot was not, however, confined to the Madras Chamber of that day A and F. Harvey's letter book of 1890 has a splendid example of "the man on the spot" protesting bitterly at the idea of extending a mill, which then contained 20,000 spindles, to 36,000 spindles. From the compound which now houses 233,000 spindles, he wrote that it would be quite impossible to find labour to run such a large addition as 16,000 spindles, while if the labour difficulty were surmounted, where on earth would the yarn be disposed of!

The Coimbatore Spinning and Weaving Co., Ltd., formed in 1888, was next in the lists, through the enterprise of the Stanes family of that district. But while Lord Napier's words had by this time been justified so far as two centres were concerned, the industry developed at a slow pace until the war of 1914-18 and the boom following it gave impetus to its expansion. These were the days of high prices—Rs 21 for a 10-lb. bundle of 20s yarn comparing with the present-day level of Rs. 5 While expansion continued during the 1920's, it took the form mainly of additions to existing units and only a comparatively small number of new companies entered the field. But the late 1920's and early '30's saw a marked change. The completion of the Pykara Hydro-Electric project gave scope for industrial expansion in the Coimbatore area which was readily seized upon by enterprising entrepreneurs. Cambodia Mills, Vasanta, Pankaja, Coimbatore Cotton, Dhanalakshmi, Janardana, Palani Andavar, Rajalakshmi, Sri Sarada—the list could be extended as mill after mill went up. The Government of Madras pursued a liberal policy of loans for the purchase of electric motors and generally assisted in the rapid development of what has been called the Ahmedabad of the South. Such rapid growth could not but affect markets, and internal competition in all yarn markets of India became acute. The very nature of the industry's organization made it inevitable. On the one hand, one large-scale concern in the form of the Madura Mills Company with its 5 lakhs of spindles, worked in large units and, on the other, there were many smaller units, each competing one with the other but in total aggregating a further 5 lakhs of spindles. When Japan depreciated the yen in 1933 and tremendous external competition followed in yarn as well as cloth markets, the outlook looked gloomy indeed. In that year, and indeed ever since, the industry has had to peg away at the Government of India to take appropriate tariff action. In the main, however, the industry has had to fend for itself, unlike its more favoured friends of the weaving industry. The steps taken were varied but in the main have proved fairly effective. Up till 1933, the range of counts in southern mills was generally 20s to 32s, the great bulk of the spinnings going to the handloom weavers of India and Burma. As competition became acute, 40s counts were introduced in greater quantities to relieve the pressure in 20s to 32s. This was followed by the introduction of fine counts, both combed and carded, so that to-day Madura and Coimbatore are producing 60s and 80s in large (Continued on p. 237)



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THE TEXTILE INDUSTRY IN THE UNITED PROVINCES

В

Sir JWALA P. SRIVASTAVA, Kt., D.Sc., D.Litt., M.L.A.

THE textile industry in the U.P. which employs to-day over 40,000 men in 29 factories and ranks as the principal organized industry in the Province, had an adventurous beginning Its foundation was laid at Cawnpore by a group of pioneering Europeans. The annexation of Oudh in 1856 gave a very considerable impetus to Cawnpore's trade and industry and brought to the city many of the renowned craftsmen of Lucknow. Though the Mutiny brought ruin to many, there followed after the Mutiny a period of still greater industrial activity. The site of the British entrenchments, commanding the bridge across the Ganges, was converted into a Government Leather and Clothing Factory, and the opening of the East Indian Railway brought much new enterprise and greater incentive to industrial growth. The organization of industry begun by Government for the provision of clothing for its troops, was taken up by private individuals and, in 1860, an association, styled The Cawnpore Cotton Committee, was formed, largely on the initiative of a Mr. Buist, the Station Master of the newly opened East Indian Railway With him were associated several Indian and British merchants and military officers, notable among whom was Mr Hugh Maxwell, partner in the firm of Begg, Maxwell & Co. His family had owned large estates in the Cawnpore District since the beginning of a century. This enterprising association brought into being the "Elgin Cotton Spinning and Weaving Co, Ltd.," which was incorporated in 1860 and commenced work in 1864, the initial capital being Rs 3 lakhs. The company was, however, forced to go into liquidation in 1871 and the property and goodwill were sold by auction, and the partners of this firm, together with Mr. A S. B. Chapman, put the mill upon its feet again in 1871. Mr. Gavin Jones, a relative of Mr. Hugh Maxwell, who had survived the Mutiny after thrilling adventures and escapes, had been engaged as Manager and Secretary of the original Elgin Mills Company prior to its liquidation, but owing to differences had resigned his post. He rejoined the newly constituted company in the same capacity Later he left the Elgin Mills in order to start the Muir Mills Company which was registered in 1874 with a capital of Rs. 5 lakhs.

Another employee of the Elgin Mills, Mr. John Harwood, left that concern in 1882 and established the Cawnpore Cotton Mills. The company was registered in 1883 with a capital of Rs 5 lakhs. Mr. Atherton West, yet another Weaving Master brought out from Lancashire by the Elgin Mills, left that parent mill and set up the Victoria Mills Co., Ltd, in 1886, finding the initial capital of Rs. 5 lakhs in India. Very closely interested in this undertaking was an old-established Indian firm, Messrs. Ramnath Baijnath. Another branch of the family tree of Cawnpore industry was the Swadeshi Cotton Mills, which were set up in 1911 by Mr. A F. Horsman, for many years Manager of the Cawnpore Cotton Mills, and this concern was registered as a private limited company in 1921.

The Ramnath Baijnath Association with the Cawn pore Cotton Mills is responsible for yet another branch of the tree, for the present Juggilal Kamlapat Mills have been built by private interests descended from that old-established firm of Ramnath Baijnath. The Atherton Mills furnished yet another branch of the tree, of more recent growth, as they were set up by Messrs Atherton West and Company, among the directors being the sons of Mr. Atherton West, who founded the Victoria Mills. In 1920 the latter concern was taken over by the New Victoria Mills Co., Ltd., with an authorized capital of Rs. 5 crores, of which Rs. 135 lakhs were subscribed principally in India.

Progress During Last Twenty Years

In spite of many difficulties the textile industry in this Province has made commendable progress during the last 20 years. The following figures well illustrate the development that has taken place. In 1918 there were 18 textile factories in the Province with a total of 460,356 spindles and 4,798 looms, the average number of daily workers being only 15,192. In 1939 the number of mills had increased to 29. The number of spindles and looms stood at 742,811 and 11,972 respectively, while the average number of daily workers had reached the substantial figure of 42,785 The main growth of the industry throughout the period quoted has taken place in Cawnpore. The statement is borne out by the following data. In 1918 there were only six textile factories in Cawnpore. The number of spindles was 319,502 and looms 4,435, the number of workers engaged being 10,695. In 1939 there were as many as 15 cotton mills in Cawnpore equipped with a total of 550,877 spindles and 10,939 looms and with about 35,000 workers on their pay-rolls.

Several factors have contributed to the rapid growth of the textile industry in Cawnpore. The city has a strateque advantage as regards communications to command a large tract of neighbouring areas. Secondly, Cawnpore, has an abundant supply of raw cotton, and, thirdly, the city itself is an important distributing centre for the piecegoods trade. Though the growth of the industry has been rapid in the Province there is still scope for considerable expansion. The figures of the last four years show that Indian cotton production is generally on the increase. From 4,857,000 bales in 1934-35 it increased to 5,933,000 in 1936-37, and 5,663,000 in 1937-38. The drop in figures of 1937-38 is due to the exclusion of Burma. The United Provinces produced 194,000 bales in 1934-35, 195,000 m 1935-36, 175,000 in 1936-37, and 197,000 in 1937-38. The consumption of cotton by Indian mills was 2,631,296 bales in 1936-37 and 2,993,741 in 1937-38. The consumption by the UP mills steadily increased from 160,522 bales in 1923-24 to 234,205 in 1929-30 and 299,073 in 1936-37. In 1937-38 it was 288,320 bales. In 1937 the Indian crop was 7,348,000 bales of which our home consumption amounted to 3,081,000 bales. We exported



4,267,000 bales, of which Japan imported 404,000 bales. In Indian cotton economy, therefore, the agriculturist depends for over half his production on exports.

Liberal Railway Rates Policy Wanted

The increasing world production, the continued fall in prices and the growing difficulties of export of Indian cotton, particularly to Japan, have intensified the problem of our cotton agriculturists. As was pointed out by Mr. H B Shroff, Principal, Government Central Textile Institute, Cawnpore, in an informative article in a Northern Indian journal, the American subsidy of 15 cents per lb. on cotton exports has made the situation of Indian cotton more critical, and we have to look to increased cotton consumption in the country itself instead of merely depending upon exports for more than half of our cotton production. Although owing to war conditions a rise in cotton prices is taking place, the pre-war plight of cotton agriculture must not be lost sight of in long-range planning. I reiterate that the U.P., in spite of its vigorous drive for self-sufficiency, in the field of textiles is as yet far from its goal and the Province can consume a large surplus of Indian cotton provided both Government and the railways adopt a more liberal policy to foster the growth of the industry. The yearly output of yarn and cloth in lb. by the UP. mills for 1911-12, 1917-18, 1925-26, 1929-30, 1937-38, 1938-39, was 39,487,000 and 94,82,000, 39,447,000 and 12,763,000, 60,292,000 and 18,478,000, 76,420,000 and 30,339,000, 107,399,774 and 63,382,156, and 117,703,838 and 61,608,727, respectively. The qualities of yarn produced in the United Provinces mills will be seen from the following figures, and it will be noticed that the main output is between 10 and 20 counts. Counts 1 to 10:23,205,937 lb. in 1938-39, 17,187,176 lb. in 1937-38, 19,711,515 lb. m 1936-37; counts 11 to 20: 56,264,156 lb., 52,553,448 lb., 59,186,756 lb.; counts 21 to 30: 30,813,283 lb., 31,527,543 lb., 30,896,564 lb; counts 31 to 40. 4,744,962 lb, 3,848,590 lb., 2,910,298 lb.; counts above 40: 4,027, lb., 19,137 lb., 42,195 lb, and wastes, etc., 2,671,473 lb., 2,263,880 lb., 2,255,411 lb. Cotton grown in the United Provinces is generally not suitable for spinning anything higher than 10 to 12 counts. This is a matter of some significance, but I will refer to it later.

The quantities of cloth woven in the U.P mills are shown by the following figures:—

The yearly output of grey and bleached piecegoods in 1936-37, 1937-38 and 1938-39 was 58,661,647 lb, 59,680,891 lb. and 57,906,797 lb.; of coloured piecegoods in the three years was 2,561,780 lb, 1,655,724 lb., and 1,794,403 lb., of grey and coloured goods other than piecegoods was 1,005,231 lb., 980,002 lb. and 902,975 lb.; of hosiery 639,889 lb, 981,665 lb., and 984,587 lb and of miscellaneous 53,460 lb, 83,874 lb. and 19,965 lb.

The handloom industry of spinning and weaving has spread all over the country, and it is estimated that in the cotton industry there are over 2,250,000 looms. Of these over 100,000 looms are woollen looms, employing over 400,000 men in the cottage and woollen industry alone. In the United Provinces the estimated consumption of cotton yarn by the handloom industry comes to 52,000,000 lb., producing about 230,000,000 yards of cloth. This is nearly equal to the total production of the United Provinces mills which comes to 238,000,000 yards.

On a population basis, however, and putting the cloth consumption at 15 yards per head, the total cloth requirement of the United Provinces, as has been stressed by more than one statistician, comes to 750,000,000 yards. It will thus be seen that the U.P. cotton industry, both handloom and mill, has a field for expansion to the extent of about 312,000,000 yards

The Problem in the U.P.

Our Province at the present moment imports roughly 800,000 maunds of Indian piecegoods, in other words, 64 million lb. which for the purpose of estimate may be reduced to, say, 300 million yards. The bulk of the import from other provinces consists of finer goods. It may be stated, therefore, that if we are to capture a good part of our remaining home market of 300 million yards, we must be in a position to place in the market an increasing quantity of finer goods. Unless this is done, we may find it increasingly difficult to hold our own even in the home market against the imported finer goods. It is here that I would like to emphasize the difficulties that we are experiencing because of the unimaginative policy of Government and the railways. The cotton textile industry of this Province is largely dependent on its raw materials supplied from Punjab sources The reason is that, the U.P cotton being of a short staple, mills are unable to consume economically a large part of it for the production of finer goods. On coarse basis, leaving aside the increased demand caused temporarily by the war, the textile industry in the Province has made considerable headway and our crying need is to produce finer cloth. As I have stated before, we are drawing our supplies of superior cotton almost entirely from Punjab sources, but in order to manufacture finer goods we should also be in a position to use Sind, American, Cambodia and Egyptian cottons. But the rail freight from the growing centres or from the port of import to Cawnpore is so high as to preclude, to a very great extent, our chances of consuming these cottons economically. It is true that our competitors in other Provinces have to incur rail freight in placing their goods in our home market in competition with us, but their advantage as regards supply of raw material is so great as to outweigh the disadvantage on account of the cost of transporting finished goods to our home market. It is mainly the progressive enhancement of rail freight that has held up the expansion of the finer section of the textile industry in the Province.

So far as the articles manufactured from coarse counts are concerned, our products are second to none in the country. Tents, domestic cloths and sheeting, etc., are being manufactured now at an accelerated pace and we can take our share of credit for supplying the clothing requirements of His Majesty's forces. The industry, owing to war conditions, will probably be called upon to bear a heavier burden—maximum hours of work, maximum production, maximum number of workers employed, high wages. The United Provinces, along with the rest of industrial India, has been called upon to clothe the Allied armies and many of the allied peoples. The textile industry in the U.P. is ready and extremely well equipped for further responsibility.

The Wool Textile Industry

The Province has contributed much to the growth of the wool textile industry in the country. There were at the beginning of the year nearly 73 power woollen factories and 264 non-power woollen factories of all kinds (Continued on p. 159)

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and

Furnishing Fabrics in delightful shades and most modern designs

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Excellent Bed Linen:

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Ladies' and Gents'
Handkerchiefs

in lovely colours and designs

THE TEXTILE INDUSTRY IN SOUTH INDIA

B۷

Dewan Bahadur C. S. RATNASABAPATI MUDALIAR

Chairman, Southern India Millowners' Association. Combatore

THE rise and growth of the textile industry in South India is one of the marked features in the industrial history of India. It is a commonplace saying that India is an agricultural country, pointing out the imperative need for industrialization in the interests of the harmonious economic development of the country. If India is very prominently agricultural and less industrial, South India has been notoriously so, as could be seen from a comparative study of the industrial advancement of the two parts of this country. The establishment and development of the textile industry in the south has, therefore a significance of considerable importance.

The history of the textile industry in South India falls into three main periods, the first period commencing more than half a century ago and concluding with the beginning of the Great War of 1914; the second between 1914 and 1932, and the third commencing with 1932. The first period shows the humble beginnings by the pioneers of the textile industry, when three mills in Madura and Coimbatore were all the component parts of the textile industry. The second period witnessed the impetus given to industries generally by the boom conditions created by war and followed up for a time during the post-war period in the twenties of this century. It was during this period that a few more came to be added to the list of textile mills which, taking advantage of the splendid business conditions, have got themselves firmly established. It was, however, in the third period that a remarkable development came to be registered, when a number of mills were established in the south, at Coimbatore, Trichinopoly, Salem, Malabar and one or two other places

Paradoxical as it may appear, it was during a period of depression that a large number of mills came to be established. For, the third phase of the development of the textile industry in South India coincided with the period of the terrible world slump that set in in 1929. The foremost reason for the growth of textile mills during this period was the fact that electric power from the Pykara scheme was made available from 1932. The establishment of a number of mills during this period could be ascribed to the opportunity thus afforded by power supply tending to promote industrialization. There are other reasons as well, and these were directly created by slump conditions. Agriculture was found withering and cotton centres like Coimbatore and parts of Southern India afforded a good field for the entrepreneurs to tap the available raw materials which otherwise were in a state of overproduction and slump-stricken condition There was plenty of labour which required to be absorbed from agriculture, serving to remove the burden on land and offering itself for industrial employment. In the slump-stricken conditions when unemployment of money along with unemployment of men and material became the order of the day, the entrepreneurs—the managing agents of textile mills,—came into the field and found a way out of this triple unemployment, affording scope for the utilization of capital, labour and raw materials, and thus sought to build this industry and stand by it, weathering the storm that was blowing over the economic world by way of depression

What is the present position of the industry that has thus been promoted? There are to-day about 69 mills in the whole of South India, employing a labour force of about 74,812, with looms numbering about 9,700, and spindles about 1,506,213 Of these 31 mills are located within the district of Coimbatore Others are situated in Madura (which holds the largest establishment in South India) Madras, Trichinopoly, Malabar and Cochin, Salem and Tinnevelly.

The establishment of the textile industry thus provides a market for primary producers, and in turn looks to them as consumers. Land, labour and capital of the locality are all thus set in motion by the establishment of mills serving to secure all-round economic progress in agriculture, industry and trade, and relieving unemployment

Even here there are problems facing the future of the industry Indeed, in the immediate past, the industry was faced with strikes by workers which at times assumed such proportions as to cause not a little anxiety to those interested in South India's economic progress. General strikes, lightning strikes and stay-in-strikes were resorted to by workers especially in the year 1937 resulting in the institution of a Court of Inquiry, whose recommendations regarding wages, hours of work, etc., were all embodied in a *communique* issued by the Ministry then in power, and which the mills agreed to implement in the interests of industrial peace, though at increased manufacturing cost to themselves.

Some of the unfavourable conditions created by budgetary arrangements like the doubling of import duty on long-staple cotton, by the trade arrangements with the other countries and the outbreak of war have brought fresh problems to be faced by the industry. The prices of machinery, spare parts, and the requirements of the industry, chemicals and dyestuffs have gone up, adding to the cost of manufacture. It has come to be subjected to increased taxation, Excess Profits Tax and the surcharge of income-tax further adding to the monetary burden.

The industry, on the other hand, needs proper support at the hands of Government and the public; and efforts should be made to relieve it of the numerous burdens. The burden on the textile industry will cripple, in its ultimate effect, the agriculturist, the labourer and the handloom weaver and constitute, at least indirectly, a burden on agriculture and the handloom. A stimulus to agriculture, an impetus to rapid industrialization and a fillip to employment and supplementary occupation could be given by fostering the textile industry with care. Every step taken to make the textile industry grow and flourish is a step towards the improvement of agriculture and commerce, in short, towards a

The VISHNU

COTTON MILL LIMITED SHOLAPUR.

ESTABLISHED IN 1910

Paid-up Capital: Rs. 24,00,000.

Spindles: 60,912.

Workpeople employed: 3,300.

Looms: 1,465.

SPECIALITIES:

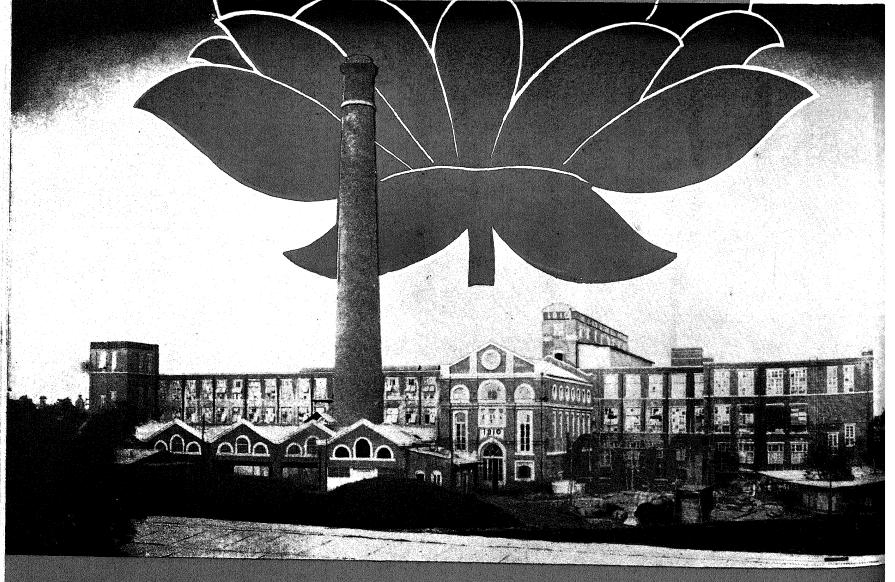
Coarse Domestics.
Sails Tent Cloth.
Canvas (Dyed and Grey).
Domestics.
Sheetings.
Shirtings.

Longcloth.
Coatings and Trouserings.
Tweeds.
Checks.
Twills.

Drills.

Hollands.
Bed Tickings, Striped and Check pattern.
Table Cloth.
Napkins.
Upholstery Cloth.

Fancy Yarn Coatings.
Fancy Yarn Shirtings.
Bed Quilts.
Jacquard Counterpanes.
Mock Leno.
Towellings.



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The LAKHSHMI COTTON MFG. CO.LIMITED. SHOLAPUR.

ESTABLISHED IN 1899

Paid-up Capital: Rs. 16,00,000.

Spindles: 46,596.

Looms: 1,341.

Workpeople employed: 3,100.

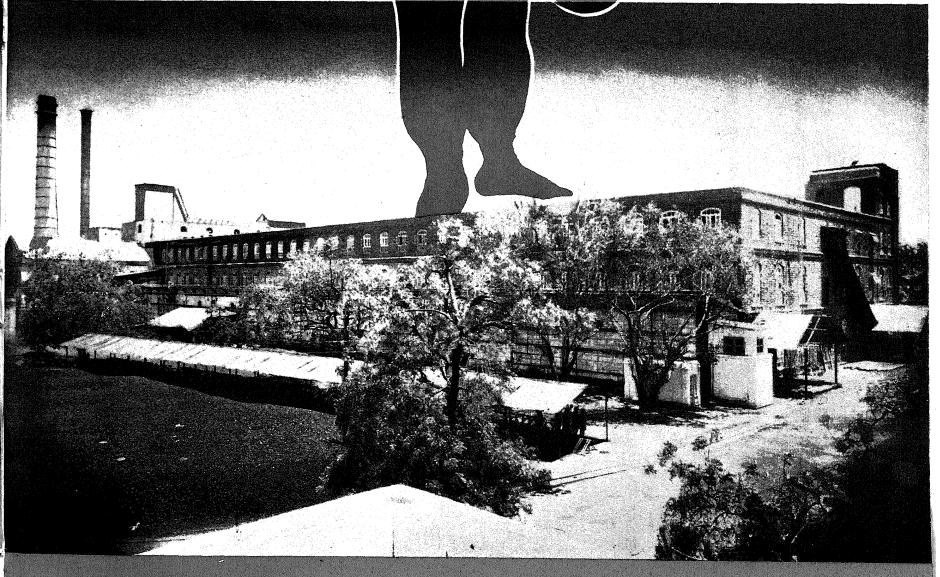
SPECIALITIES:

Coarse Domestics. Sails, Tent Cloth. Canvas (Dyed and Grey). Domestics. Sheetings. Shirtings. Longcloth. Coatings and Trouserings.

Tweeds. Checks. Bed Tickings, Striped and Check Designs. Table Cloth. **Napkius** Upholstery Cloth.

Furnishing Cloth. Jacquard Furnishings. Fancy Yarn Coatings. Bed Quilts. Jacquard Counterpanes. Mock Lenos. Twills.

Drills. Hollands. Towellings. Jaconets. Mulls. Muslins. Lawns. Cambrics.



MANAGING THE BOMBAY COMPANY LTD 9, WALLACE STREET, A G E N T S THE BOMBAY COMPANY LTD 9, WALLACE STREET,



DHOTIES: Bleached, Bleached and Mercerised.

SAREES: Bleached, Bleached and Mercerised and Dyed.

STRIPED SHIRTINGS, POPLINS, LONGCLOTHS, CAMBRICS, MULLS, DORIAS, COATINGS, VOILES (Plain and Striped), TWILLS, CREPES, LIMBRICS

progressive economy not only in South India but the country as a whole.

In the history of the textile industry in South India, the establishment of the Southern India Millowners' Association is a landmark. The Association is the only organization of millowners in South India. The Association, located at Coimbatore, was founded in 1933, during the third period of industrial expansion Since then it has been slowly and steadily growing. building up a tradition of its own that would serve to secure the best ends of the textile industry.

The Association has been devoting itself to the study of problems facing millowners and the industry from time to time, arising out of either internal causes or external factors. Prominent problems issuing out of internal causes relate to labour troubles and industrial unrest consequent on strikes by workers Indeed, the strength and soundness of a body like this could be best tested on occasions of stress, and the fact that the Association has weathered a menace of the kind witnessed in the year 1937 is eloquent testimony to its success. When the Court of Inquiry was instituted, the Association put up the case of the millowners, though it is to be regretted that many of its contentions were not accepted by the Court The Association did not on that score reject its recommendations but readily agreed to implement them when they were incorporated in a Government communique.

The Association has been throughout watchful of the conditions and factors affecting the textile industry It has from time to time taken up matters, legislative and financial, which affected the growth of the textile industry. It submitted its views to the Tariff Board appointed ın 1934 through a deputation. Agaın, when the doubling of the cotton duty was proposed as a budget measure the Association, along with similar bodies, waited in deputation on the Finance Member, though it did not secure relief. The Association has been, indeed, quite vigilant in making its representations to the Provincial Government when the Sales Tax was imposed as a budget measure and got exemption for cotton and yarn from that duty. At the moment it has before it the problem of reconciling the conflicting claims of the mill and handloom industries and has sent its representations to the Government of India, urging a solution to be arrived at by a conference of representatives of mills and the handloom industry. It is my ardent hope that the question will be solved amicably and form another achievement of the Association. The Association has also been interesting itself in the problem of surplus production of raw commodities, especially cotton, and has suggested that the solution of the problem lies in giving governmental and to facilitate export of finished mill products. It has pleaded for facilities like cheap freight, insurance, and

The textile industry is to-day a key industry, whose growth is of vital concern to the progress of Indian economy. It is getting firmly established in South India, much to the advantage of agriculture, handloom and other trades, having vast potentialities for speeding up production on all sides, relieving unemployment and facilitating the harmonious development of South Indian economy as a whole. In this task the Southern India Millowners' Association has, I may claim, been playing a worthy part and, I hope, will continue to do so for long, so that it may hasten the pace of national and provincial economic progress

The Textile Industry in the United Provinces-

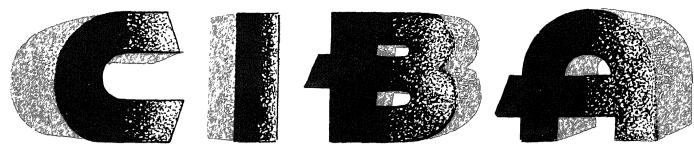
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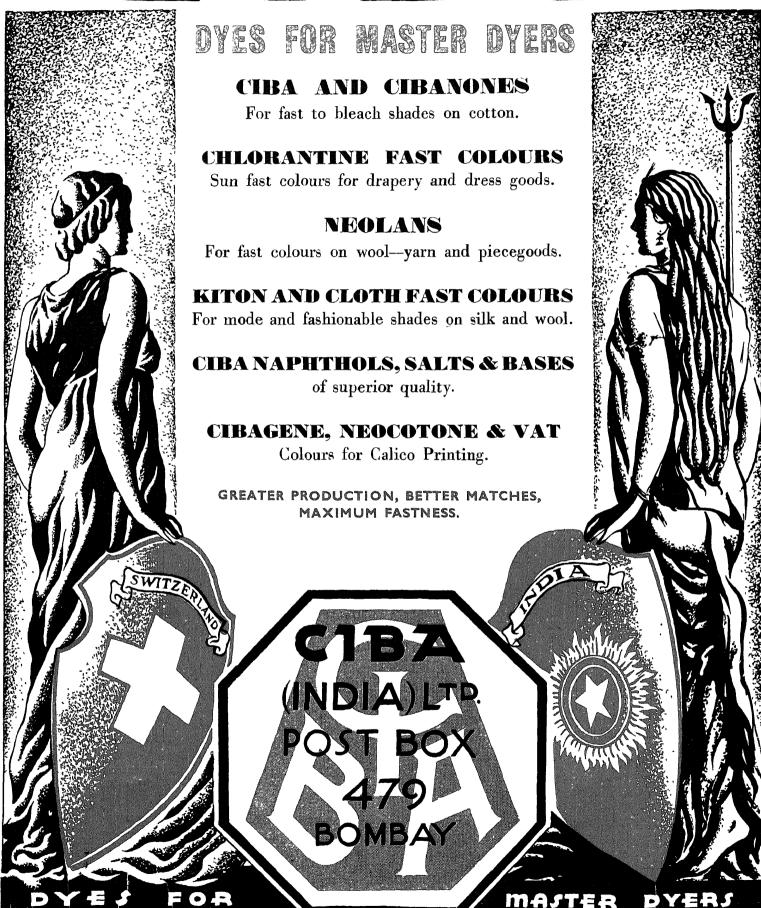
in India. Of these the United Provinces has six power and 33 non-power woollen factories. It may, however, be stated that in extent, volume and output the handloom woollen industry greatly outweighs the woollen mill industry. The U.P. handlooms consume raw wool to the extent of 5,000,000 lb and produce kamlies and shawls of 1,340,000 lb, piecegoods 750,000 lb. and carpets 650,000 lb. According to last year's figures, Indian woollen mills using power are 13 in number having 93,000 spindles and 2,000 looms. Their annual output amounts to 30,000,000 lb of woollen goods, valued at Rs. 2½ crores. The volume of our production can be judged by the fact that the Lalimli Mills together with its sister concern Dhariwal, are responsible for half the total output of Indian woollen mills. The war has given a fillip to the wool textile industry in the U.P. and we are supplying blankets and winter comforts to the army in thousands. Our resources in this sphere are great and I personally think that the woollen industry in the U.P. will continue to occupy, for a long time, its present pre-eminent position. No proper statistics for wool produced in this Province are available, but it has been estimated that 24,500 maunds of wool are produced in the hills and plains, of which 20,000 maunds are produced in hill districts only. In addition to this, the Bhootias bring from Tibet 27,000 maunds annually to the U P. markets. The chief wool marketing centres in the U.P. are Muttra, Kosi Kalan, Agra, Etawah, Jhansi, Lalitpur, Mirzapur, Bhadoi, Tanakpur and Haldwani, and marketing seasons are February to March, June to July and October to November.

Jute is not our Province, yet it is interesting to note that out of 75 jute mills in the country three are situated in the U.P. Two of these are at Cawnpore.

The extraordinary position created by the war has revealed the extent to which the textile industry in this country is dependent for its day-to-day running on foreign imports. Machines, machine parts and stores needed are mostly imported although attempts have been made during recent years to undertake the manufacturing of loom and loom parts. The sizing ingredients, starches and chemicals like zinc chloride are imported. It is estimated that India consumes annually about Rs. 3 crores worth of dyes. The United Provinces requires dyes worth about Rs. 45 lakhs, of which more than half is required for the cottage industry. Some starch factories have been started in the U.P but they depend on Government encouragement to ensure their continuance after the war.

We in the U.P. have done our best to expand the textile industry on sound lines. We may not have been successful all along the line. We have encountered peculiar difficulties which have hampered our progress But I hope I have been able to make out in this article that industrialists in this Province are still imbued with that pioneering spirit which characterized the founders of the industry more than half a century ago. I hope I shall not be accused of making a fetish of local patriotism when I say that the steady development of the textile industry in spite of its many difficulties unmistakably shows that the U.P's drive for self-sufficiency will meet with unqualified success in the field of textiles in the not-too-distant future.





COTTON TEXTILE INDUSTRY IN BENGAL

By

SUBINOY BHATTACHARYA, M.A.

Secretary, Bengal Millowners' Association, Calcutta

THE history of the cotton textile industry in Bengal is as eventful as it is interesting. If it serves no other useful purpose, the narration of it would tend to show the long and glorious tradition behind Bengal, and that endeavours to resuscitate the industry in the Province cannot be lightly brushed aside as narrow parochialism.

Ancient History

Bengal's claim to the manufacture of linen and a sort of fine white silk dates back to some three centuries before the Christian era. But we have frequent references to the manufacture of the finest types of cotton cloth in Bengal in Kautilya's Arthasastra of about 400 B.C. It is widely believed that Egyptian mummies have been found wrapped in Bengal muslins. There is, however, no doubt that by the beginning of the Christian era the cotton manufactures of the country became fully known to the Greeks. Next, many references to cotton cloth are met with in the Varaha Samhita, i.e., A.D. 600. It may incidentally be mentioned that even about three centuries ago cotton was comparatively unknown to the civilized nations of the West. In the ninth century, the Arabian traveller Sulaiman wrote: "In the Bahamni Kingdom (i.e., Eastern Bengal) such fine cotton fabrics are produced that a full-sized cloth passes right through the hole of a ring." Marco Polo in 1290, the English traveller Ralph Fitch in 1583, and Abul Fazl, the author of Ani-1-Akbarı, referred to the famous cotton industry of Bengal in their works. It is known from their writings that at Sonargaon, Dacca, the best and finest cloth in India used to be produced. In 1675-80, muslin used to be manufactured at Santipur, Maldah and Hooghly.

The famous muslins of Dacca at one time became the craze of the elite of society. The poetic names given to the different varieties give one an idea of their fineness: Ab-i-rawan (running water), Bakt hawa (made of air), Shab nam (the evening dew) and so on. It is said of Aurangzeb's daughter that she was chastised by her father for being insufficiently clad although she had worn seven muslin garments one over another. Another anecdote says that a cow, while grazing, swallowed a full ten-cubit long Abiuyan cloth which had been spread on grass to dry. The skill, patience and perseverance of the weavers who manufactured such extraordinarily fine cloth are indeed amazing. It is said that it took a weaver at least five months to produce such a fine piece of cloth and the spinner about two years to spin the necessary yarn. It is also said that both the spinning and weaving had to be done during the hours of dawn before sunrise, by the side of a pond, in order to ensure a humid and cool atmosphere. Otherwise the yarn would break—so remarkably delicate was the yarn! It can, therefore, easily be imagined that the cost of such cloth was not inconsiderable. Even during the middle of the last century the price of mulmul khus was Rs. 10 per yard—that is to say about Rs. 30 in the denomination of the present days. A piece of Dacca jamdani

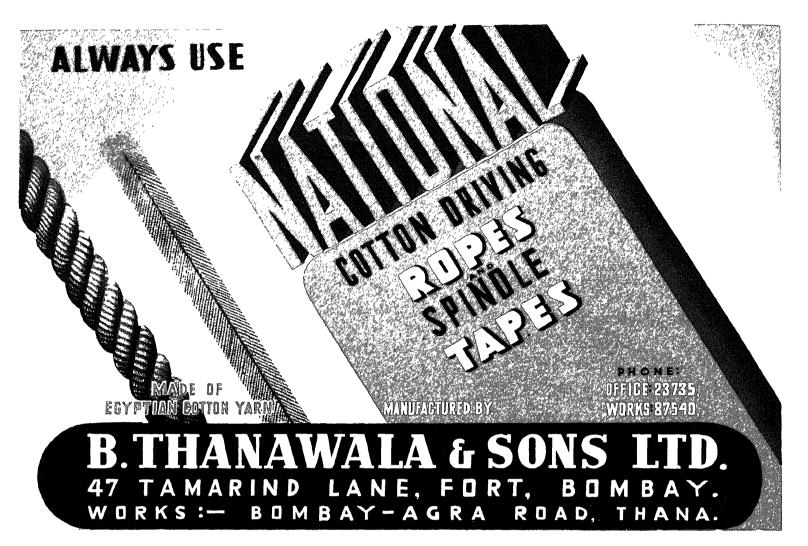
cost Rs 450 and a piece of *Ab-i-yara* 5 yds. x 36 ins. cost Rs. 400. It was possible for the industry to flourish under Mahommedan rule because of the patronage extended to it by the padshahs, nabobs and their courtiers. The lay public evidently could not afford to buy such expensive stuff.

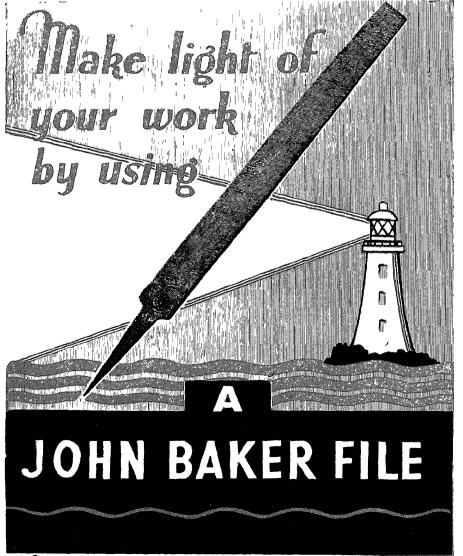
It is on record that Bengal used to export cotton goods in bulk quantities to France, Holland and England in 1657. But the Dacca muslin was first exported to England in 1666. By 1675 the fashion of wearing muslins, the costlier fabrics of Dacca, as well as the cheaper stuff from other parts of the country became pretty prevalent in England. This habit of the people expanded rapidly all through the last quarter of the seventeenth century till it began to excite the jealousy of the British manufacturers, so much so, indeed, that Acts of Parliament had to be passed in 1700 and 1720 prohibiting the importation of certain classes of Bengal-made piecegoods into the United Kingdom. It may incidentally be mentioned that Bombay and Surat then used to send raw cotton to feed the Bengal looms, but it is on record that Dacca muslins were manufactured entirely out of the produce of the Dacca district.

The Decline

Although the cotton textile industry was by far the most flourishing one of the Province at the time, there is no reason to suppose that the people of the soil profited from it to any appreciable extent. Like indigo, it was practically the monopoly of the East India Company, whose gomostahs (native agents) meted out abominable treatment to the local weavers, whom they compelled to accept dadans or advances. The price paid was so wretched and the terms of contract were so iniquitous to the weaver that they gave rise to the "weavers' thumb" story, which stated that the East India Company chopped off the thumbs of the weavers so that they might not ply an independent trade of their own. Or alternatively, the weavers themselves cut off their thumbs to avoid being coerced into working for the Company

A decline in French and Dutch commerce set in in 1759, and it finally collapsed during the troublous days of the French Revolution (1789-95). During the period 1771 to 1793 the East India Company exercised a quasi-monopoly over the export trade in cotton goods of Bengal. In the year 1772 alone, the Company exported cotton goods valued at Rs. 70 lakhs (about Rs. 1.25 crores at present-day denominations). But by that time the decline of the industry had already set in. A series of inventions in England during the latter half of the eighteenth century, e.g., Hargreave's Spinning Jenny (1767), Arkwright's Water Frame (1768), Crompton's Mule Spinning (1775), Cartwright's Power Loom (1784). that is, the Industrial Revolution in England, gave the final death-blow to the handloom industry of Bengal. There was a rapid improvement in the manufacture of British piecegoods, which began to find a ready market in India through the East India Company, who had





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willingly reversed their process of trade. Of course, British imports of piecegoods into India were not really effective till 1813. It should be noted that at the time there was no sympathetic popular Government in the country to safeguard the indigenous industry of Bengal against the onslaught of machine-made imports.

The Revival

Then came the revival under the machine era. Few people know that the first cotton mill in India was started in Bengal in 1830 under European management and was called the Fort Gloster Mills. That mill is still in existence under the name Bowreah Cotton Mills, Ltd., managed by Messrs Kettlewell Bullen & Co. Even in later years Bengal put up a fairly satisfactory performance in the race for establishing mills as compared to the other centres of the mill industry in India. In 1873 there were 28 mills in Bombay as against 15 in Bengal. Later on, however, Bengal slipped back and in 1931 there were 73 mills working in Bombay Island as against only 13 in Bengal. Since 1932, however, a new awakening has been discernible and to-day (1940) there are no less than 30 mills at work in Bengal with a complement of 9,940 looms and 444,196 spindles.

The Bengal Millowners' Association

As a premier cotton millowner of Bengal once observed: "At one time Bombay was believed to be the natural seat of the cotton mill industry on account of its climate, proximity to markets and the most important cotton-producing areas and other reasons. Though cotton is grown, more or less, in many Provinces, nearly 75 per cent. of the total crop is raised in Bombay, Central Provinces and Berar and Hyderabad State. But, in spite of these advantages, the share of the Bombay industry has receded, since 1908, from about 50 per cent. of the total Indian production to 40 per cent. due to the development of other centres like Ahmedabad, Sholapur, Madras, Delhi and Cawnpore. It is not our purpose here to discuss the relative advantages of these different centres, but we want to emphasize that the recent tendency has been for a wider distribution of cotton mills, inspite of the geographical and other advantages of Bombay and Ahmedabad. A similar trend has been observed in Europe and the U.S.A. In the life history of an industry, centralisation has undoubted advantages, but, as time goes on, it becomes a handicap. Wherever an industry is massed together, rents, taxes and cost of living go up; trade unions form; the machinery becomes old and obsolete, and inevitably new centres of production spring up; excessive concentration of population in limited areas also gives rise to difficult problems of sanitation and housing, and produces a lack of equilibrium between agriculture and industry in the country as a whole."*

Bengal, with its unforgettable tradition of the cotton textile industry of the days of yore and with spare capital, labour and enterprise seeking profitable employment, has launched on a cotton mill programme conceived on modern, up-to-date lines, and has so far achieved remarkable success in the field. The Bengal Millowners' Association was established in May 1934 by the cotton millowners of the Province under the inspiration, guidance and presidentship of Acharya Sir P. C. Ray, Kt., D.Sc., C.I.E., with the object of

safeguarding and promoting the interests of the textile industry in Bengal in the best possible manner and for ensuring a feeling of cordial relationship as between the members. It is a matter for considerable gratification that within five years of its inauguration the Association has been able to enlist more than 75 per cent. of the working mills of the Province in its membership and to secure from the rest a promise of joining the Association by next year.

It was decided at a recent meeting of the Association that hosiery, silk and artificial silk mills, as well as cotton mills under construction, shall be eligible for membership of the Association, so that it shall henceforth represent all textile mills of the Province, except jute.

It is yet too early to take stock of the actual achievements of the Association; but it has so far succeeded in persuading the Provincial Government to inaugurate a scheme for the experimental cultivation of long-staple cotton in the Province by offering to contribute Rs. 10,000 towards the expenses and to purchase all the cotton produced under the scheme at market price or even at a premium. It has also been endeavouring, with considerable success, to introduce a progressive and uniform labour policy among member-mills with a view to improving industrial relations and minimizing labour troubles in member concerns. It has consistently cooperated with the different departments of the Provincial Government in collecting and publishing statistics relating to the industry and labour. Bengal being by far the largest single market for piecegoods and the local cotton industry being of no insignificant magnitude, various questions arise from time to time, which are peculiar to the Province and demand a solution by local action. The Association, which has been acknowledged on all hands to be the accredited representative organization of the textile industry in Bengal, intervenes in all such matters and invariably secures an amicable settlement.

The following are the successive Presidents of the Association since its establishment in 1934: Acharya Sir P. C. Ray (two consecutive years), Mr. D. P. Khaitan, Mr. G. Chakravarti (two consecutive years), Mr. S. N. Mitter and Mr. S. K. Basu (present President).

The Association has regularly participated in all-India conferences of industrialists and in deputations to the Government of India in connection with matters of vital consequence to the textile trade and industry. It has, in short, been doing everything in its power to protect and promote the best interests of the textile industry of India in general and that of Bengal in particular in an adequate manner. Besides its usual duties, the Association is at present engaged in the preparation of a detailed statement regarding cotton mills at work and under various stages of construction in Bengal, so that anybody interested in the development of the industry in the Province would be able to know the correct position at a glance. It is needless to say that while encouraging the growth of sound concerns, the Association always deprecates the promotion of bogus companies. In fine, the Bengal Millowners' Association claims to be a faithful watch-dog of the interests of the textile industry and trade of Bengal. It looks back with satisfaction at its past achievements, and looks forward with confidence at the future of the industry and, along with it, the Association itself, the handmaid of the industry in this Province.

 $^{^{*}}$ A. B. Guha "Cotton Textile Industry in Bengal"—a Career Lecture delivered at the Calcutta University.



THE TEXTILE INDUSTRY IN MYSORE STATE

Βv

G. V. RAJARATNAM

Cotton Mills

The textile industry in Mysore State is a very old one. The development of cotton mills has been one of the outstanding features of the industrial progress of Mysore. There are nine cotton mills in the State with 349,147 spindles and 2,574 looms and employing over 10,500 operatives. In addition to the above number of mills, there are also 50 power-loom factories employed in the manufacture of cotton fabrics.

Production in Mysore's cotton mills has been progressively rising year by year and the rate of progress is likely to continue for some more years in view of the exceptional facilities available for the location of textile mills, thanks to the forward policy actively pursued by the Government in regard to industrialization

The annual production of cotton piecegoods which stood at about 26,493,000 yards in 1933-34 went up in 1939-40 to 40,962,000 yards. This means that in a period of eight years production has gone up by a round $14\frac{1}{2}$ million yards. In recent times there have been heavy exports of cotton cloth from the State, the figure for the year 1939-40 being 9,550,738 lbs (no yardage figures are available in this case).

Bangalore: Chief Centre

Most of the cotton mills in the State are confined to the city of Bangalore, the other centres being Mysore and Davangere. The Bangalore Woollen, Cotton and Silk Mills Co., Ltd., which was started in 1884, is one of the oldest mills in Southern India. The authorized capital of the company is Rs. 26,25,000. The long experience of these mills enables them to manufacture cotton cloth specially suited to the Indian climate which bears comparison with the best imported fabrics. This company is very progressive in its labour housing schemes, a matter of credit which is also shared by the Minerva Mill, the Mysore Spinning Co., and the Sri Krishnarajendra Mill. The Mysore Spinning and Manufacturing Co., Ltd., Bangalore, capitalized at only Rs. 12½ lakhs, possesses nearly 50,000 spindles and 520 looms with an up-to-date dyeing and bleaching plant The number of operatives working in the mills exceeds 2,300. The output of the mills per year is about 5,600,000 lbs. of yarn and 3,100,000 lbs. of cloth. The principal types made are bedsheets, dhoties, drills, coatings, shirtings, tussores, towels, mulls, etc. The Minerva Mıll in Bangalore was started in 1920 with an authorized capital of Rs. 30 lakhs. The mill is equipped with 34,016 spindles and 440 looms with an attached bleach and dye house. The mill manufactures about 4,400,000 lbs. of yarn and 3,000,000 lbs. of cloth. The principal types made are bed-sheets, dhoties, coatings, shirtings, tussores, etc. The Sri Krishnarajendra Mill, with a capital of Rs. 20 lakhs, was established with the purpose of ginning, pressing, spinning, weaving, dyeing, printing and bleaching yarns, cloth, etc Recently a weaving shed on modern lines was added to diversify production. Davangere, which is one of the leading cotton ginning and trading centres on this side of the south, has one cotton mill,

namely, the Davangere Cotton Mills, Ltd., the capital of which is Rs. 10 lakhs It has 11,200 spindles. The Mysore Government has afforded concessions by way of cheap power and land for locating the factory.

Labour Legislation

Lastly, it should be stated that harmonious industrial development has been facilitated in Mysore by looking after the interests of the workers and adopting beneficial labour legislation. In this respect Mysore has not lagged behind the most progressive British Indian Province. The recent constitution of the Labour Welfare Board by the Government is an instance of the regard paid to the amelioration of the conditions of the workers in mills and factories.

Woollen Mills

There are three large-scale woollen mills in Mysore State The total number of spindles and looms working in these mills is about 8,463 and 322, respectively, and the average number of persons employed is about 1,271. Rugs, blankets, carpets and druggets are the principal kinds of woollen goods produced in these mills, the annual production being about 1,355,548 lbs., valued at nearly Rs 12 lakhs. The blanket trade suffered considerably on account of the competition of cheap and shoddy articles from Italy and Japan, but the outbreak of war has given it an impetus, consequent on the orders placed for Army blankets by the India Government.

In addition to the large-scale mills there are also about half a dozen concerns employed in the manufacture of druggets. But the shortage in the supplies of dyestuffs, most of which are imported from abroad, and the increased railway freight and insurance charges have affected adversely the drugget industry at the present time.

Sericultural Industry

It is not generally known that Mysore produces half of the total Indian silk output. The sericultural industry plays a very important part in the economic life of the State. The rearing of mulberry silk is mostly confined to Bangalore, Mysore, Tumkur and Kolar Districts. It has been supporting in its various branches over one and a half lakhs of families. It is practised by the small-scale raiyats as a subsidiary occupation, thus affording profitable and steady employment throughout the year for women and children at home, and gives occupation to the raiyats during the agricultural off seasons. The industry is at present practised over about a third of the State's area. Mysore silk is known for its sheen and durability. Mysore silk fabrics have now become famous throughout India and their popularity is well merited.

Mulberry Cultivation

Mulberry, which is the food of the silk-worms, is grown on agricultural land. For securing larger yields and better quality of leaves improvements are effected in cultural methods and in other directions. The use of seedlings and seedling cuttings for raising mulberry gardens is encouraged as these are superior to the bush gardens raised from ordinary cuttings. Seedlings raised in the Government departmental nurseries are supplied

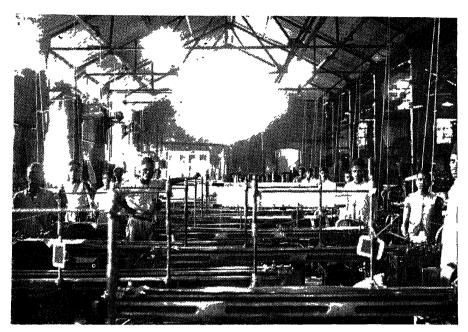
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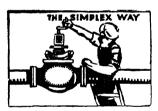
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to sericulturists in large numbers, free of cost, and sericulturists are taught to raise seedlings on their own lands. Growing of mulberry in the form of trees involves less expenditure and ensures successful results in silkworm rearing by minimizing the appearance of certain diseases. To encourage the growing of mulberry trees. Government have sanctioned a scheme for the grant of liberal bonus. Saplings fit for being raised as trees are grown in Government nurseries and supplied, free of cost, to those willing to raise topes. More than 50,000 good trees have already been raised by the sericulturists. The results of experiments conducted in Government farms in regard to improved cultural operations and manures, are communicated to the raiyats.

Gross-breeds

The two improvements which have helped sericulturists to withstand growing competition from foreign silks are the reduction in the incidence of silk-worm disease by means of controlled seed supply and the evolution of hybrids which are more resistant to disease and yield better results than the pure indigenous race.

The first generation cross-breeds evolved by the Department after a series of experiments were first made available in 1925-26. The popularity gained by these cross-breeds can be gauged from the following quinquennial statement of their distribution:—

Year	Distribution in lakhs of layings.			
1925-26 1929-30 1934-35 1938-39 1939-40	Mysore 4 29 15.71 20.31 17.90 12 85	Cross-breed 0 68 3.24 22.40 87.00 92.36	Total 4 97 18 95 42.71 104.90 105 21	

As the preparation of cross-breed layings involves a good deal of care and attention to scientific details, only the grainages which are under departmental control and which possess trained staff, have been permitted to prepare and sell the cross-breed layings to sericulturists. There are at present 10 Government-managed and 30 aided grainages supplying disease-free layings to the sericulturists. As demand is mostly for cross-breeds and as existing grainages are unable to meet the entire demand for these layings, 10 more aided grainages are to be started this year. Government have also sanctioned the starting of a Government grainage at Ummattur.

With a view to invigorating and improving the foreign races of silk-worms that are being used in connection with the preparation of the cross-breed layings, Government have sanctioned the starting of a silk-worm rearing station on the Biligirirangan Hills.

Silk Filatures

Recently a company called the Mysore Silk Filatures, Ltd., was formed with the assistance of Government to establish filatures in important sericultural centres. The company now operates two big filatures, one at T. Narasipur and the other at Mysore, and proposes to start two more branches shortly at suitable centres. A filature will be started at Channapatna as an adjunct to the Mysore Spun Silk Mills. The high grade silk reeled in existing filatures is being used not only in Mysore but also in other Indian weaving centres. The new company has already begun to get orders even from distant places like Australia.

As a result of the efforts of the Sericultural Department, owners of country *charkas* have adopted measures to remedy defects existing in their silk and to reel finer deniers of silk which are in demand. As improvements that can be effected in the silk with the *charkas* in use with the reelers are limited, an improved *charka*, capable of reeling high grade silk of almost the filature quality, was designed by the Department. Many of these improved *charkas* have been installed by the reelers and new sets with additional improvements are under manufacture.

Spun Silk

Silk waste is the main raw material for the manufacture of spun silk. Formerly all the silk waste produced in Mysore was exported During 1936, a joint-stock company was formed in Mysore with the assistance of Government for starting the Mysore Spun Silk Mills in Channapatna with up-to-date equipment for manufacturing large quantities of spun silk and noils from out of the local silk waste. A ready market for the mill's products is now found both in Mysore and in other parts of India. The successful working of the factory has helped the local reelers to obtain fair prices for their silk waste.

To find wider uses for the high grade silk produced in Mysore, the Government Silk Weaving Factory with up-to-date appliances was started by Government in 1931. High grade silk fabrics such as georgettes, crepes and satins which were not being produced in India prior to the starting of this factory are now being produced, utilizing pure Mysore silk. These fabrics are greatly appreciated all over India. The starting and working of this factory have fully demonstrated that with the raw material available in India, the highest grade silk fabrics can be produced in this country with local labour, and paved the way for the starting of such factories in other parts of India.

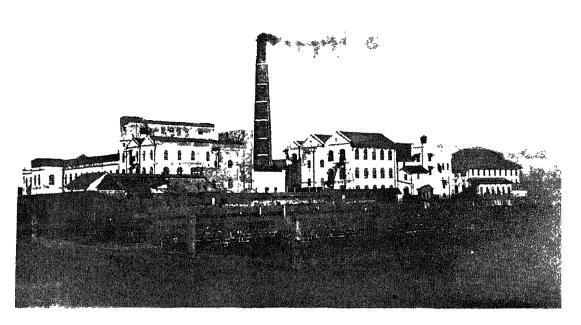
New uses have been found for silk in the manufacture of parachutes for aeroplanes and various munitions of war The annual expenditure on the Sericultural Department is over Rs. 2 lakhs and it is in charge of a Superintendent of Sericulture. Mysore is the only State to have taken measures for giving a diploma in sericulture.

Silk Tariff Duties

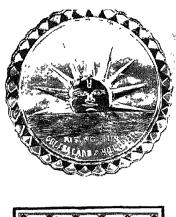
The Report of the Indian Tariff Board on silk, submitted to the Government of India as a result of the inquiries made by them into the conditions of the Indian silk industry in the year 1938, was recently published. The majority report of the Board recommended an extension of protection to the Indian sericultural industry for a further period of five years and an all-round increase in the import duties on raw silk and allied articles. But the Government of India have only continued the existing import duties on raw silk and allied articles for a further period of two years.

With a view to bringing together the experts and actual workers engaged in the sericultural industry throughout India for discussing important problems connected with the industry, the First All-India Sericultural Conference was held at Bangalore in December 1939, when the members of the Imperial Sericultural Committee and sericultural experts from all parts of India were present. The Directors of Industries and the Sericultural Experts who were in Mysore in connection with the Conference took advantage of the opportunity

(Continued on p. 175)



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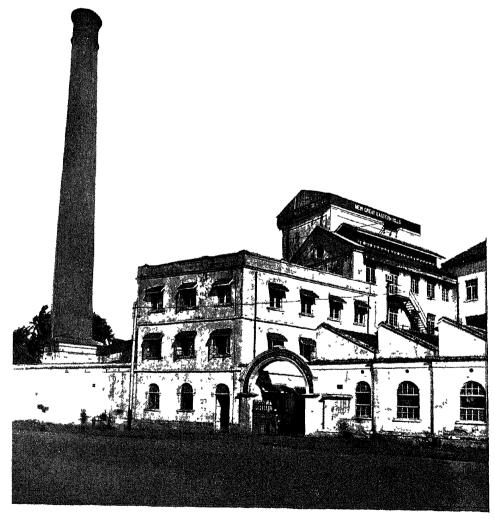




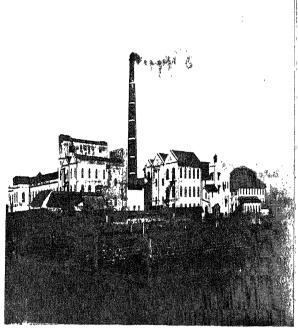




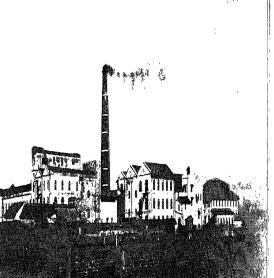




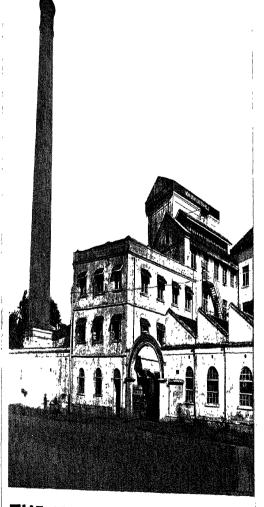
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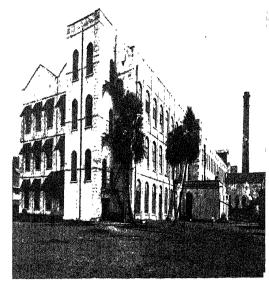






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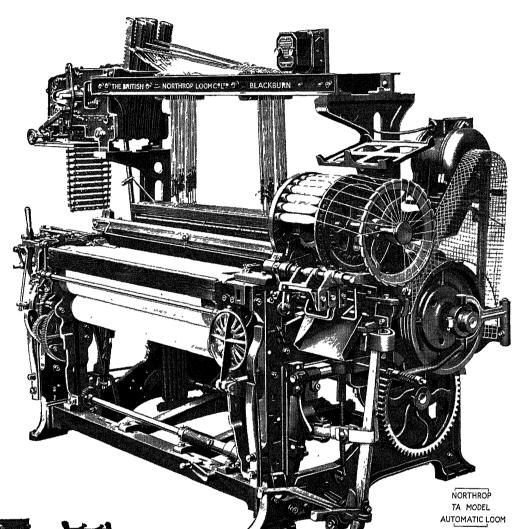
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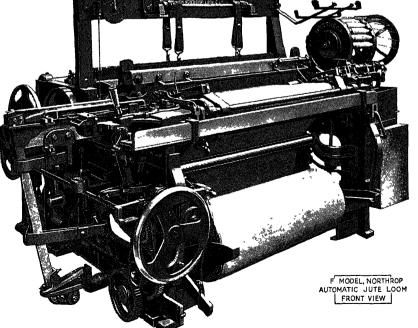
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SOHRAB K. KHAN

HE middle of the nineteenth century found in Gujarat a class of Jain and Bania traders in the possession of considerable wealth which had been secretly conserved during the previous decades, and which had survived the pillage and plunder of the period intervening between the fall of the Moghul dynasty and the departure of the invading Marathas Multiplying their wealth in indigenous trades, such as the manufacture and export of silken and embroidered cloths and the cultivation and export of indigo and cotton, these sagacious merchants began to explore new avenues for the profitable application of the wealth lying unutilized with them. Their desire was to leave to succeeding generations a substantial legacy, not easy of dissipation. It was in the minds of these that the seed of the industrial development of Gujarat germinated, and the inception of the cotton mill industry followed; their estimate of the potentialities has been abundantly justified by magnificent results which, in a good many cases, have come down to even the third and fourth generations. But, the honour of laying the foundation of the textile industry of Ahmedabad goes to the late Rao Bahadur Ranchodlal Chhotalal, C.I.E., who founded the Ahmedabad Spinning Mills in the year 1859.

How the Industry was Stabilised

The factors that contributed to the stabilization of the textile industry in Ahmedabad may be summarised as follows:—

- (1) Changing modes of life and the increasing adoption of the conventionalities of Western civilization, which brought in their wake an increasing demand for cloth *per capita* of population, with a corresponding increase in the consumption of yarn by the handloom industry which then catered to the clothing requirements of the country.
- (2) The acceleration of internal transport following upon the opening and development of better highways and the adoption of faster transportation methods; this brought Ahmedabad nearer to the trading ports of Surat, Cambay and Broach and to the then rapidly expanding port of Bombay all of which offered a quick outlet for the manufactures of Ahmedabad and a corresponding increase in the returns from investments.
- (3) The proximity of the consuming markets (for yarns) which at that period were chiefly the handloom weaving centres in and around Ahmedabad, and the not too distant Bombay market for the export trade.
- (4) The abundance of capital available for investment and the keen desire for its profitable application, combined with a shrewd insight into the relative possibilities of different trades.
- (5) The inherent business aptitude and trading sagacity which were the outstanding traits of those pioneer merchants of Ahmedabad, and which have been inherited in large measure by the present-day industrialists of that city.

In the industrial development of Ahmedabad, each phase was the result of the most careful appraisal of the

potentialities of each successive idea and its practical application to actual conditions. The result has been the steady growth of a staple industry, proving that methodical consolidation is the foundation of successful industrialization. Beginning with modest outlays of capital and small layouts of plant, in almost all cases the different mill companies gradually but progressively increased in size and capacity. This policy is the bedrock on which the industry to-day stands so firmly, having weathered many a storm and having emerged safely from many a depression. This consolidation of capital brought with it its rich reward—the solid confidence of the investing public

The first fifty years were years of trials and tribulations; they were the formative years when the industry was conducted mainly by rule-of-thumb methods. In that period, the chief preoccupation was provincial, the two main adjuncts of a manufacturing industry-raw materials and consuming markets—being both mostly localized in and around Gujarat, the handlooms of Rajputana, Gujarat, and Kathiawar, and the yarn markets of Bombay being the possible limits of demand for their products. Later came the prosperous yarn trade with China which raised and nourished the industry in subsequent years. Those were more spacious days when commercial activities were attended with little or none of the hustle and bustle of modern trading activities, and the profit margin was invariably wide enough to induce a certain smug self-satisfaction amongst manufacturers.

Dark Clouds

The next decade saw dark clouds on the horizon, and the entry into the sixth decade (1908-12) saw the yarn trade with China fast disappearing. Plans had, therefore, to be developed to find ways and means to counteract the adverse ratio of supply to demand. This led to the gradual transformation of a spinning industry into a complete weaving and manufacturing industry within the short space of two decades. By 1935 almost all mills in Ahmedabad had their weaving sheds, the industry running on a complete vertical basis from the opening of the cotton bales to the baling of the piecegoods.

With the year 1914 dawned a new era, and the inflated boom conditions throughout the country gave a great impetus to the industry, firstly for making greater profits, then for expansion and development. Bumper profits accrued for the duration of the Great War and the immediately following post-war boom. Whereas in other industries fabulous profits went to line private pockets, and abnormal dividends were the order of the day, the Ahmedabad millowners with firm determination set their faces against such practices, and held fast to their ideal of achieving enduring success. No mills were over-capitalized to earn more dividends, nor were dividends dissipated. Substantial reserve funds were built up, depreciation funds were accumulated and applied to the improvement of the basic machinery and the introduction and adoption of new plants for the

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scientific finishing and marketing of goods, factors so essential to the growth and prosperity of an industry. In this connection, the Tariff Board (1936) observed:

"It is noticeable that while the production (all-India) of woven goods since 1931 has increased by 25 per cent, the production of yarns has gone up by 15 per cent only.... At Ahmedabad, on the other hand, the production of yarns and of coloured goods has increased by 31 and 89 per cent., respectively, and the total amount of woven goods by 34 per cent

by 34 per cent. While the percentage of counts above 40s has increased from 10 to 14 for the whole country, the mills in Ahmedabad have increased their output of these higher counts from 20 to 26 per cent, since 1931 During this period these (Ahmedabad) mills have increased their production of counts above 40s from 11 to 21 millions of lbs.

The analysis clearly indicates that Indian millions at stoodily record.

The analysis clearly indicates that Indian mills are steadily raising their standards of manufacture and emphasizes the lead taken by Ahmedabad in the production of finer qualities of cloth "

The policy that has been always adopted in the industrialization of Gujarat and the industrial development of Ahmedabad, was to begin with modest capital investments and small, easily-handled but commercially profitable manufacturing plants: this was followed by the expansion of productive capacity through the enlargement of plants from accumulated profits; such expansion proved highly profitable because of the initial experience and first-hand knowledge gathered in the early stages which ensured success in subsequent large-scale operations. This cautious consolidation won the confidence of the investing public to such an extent that a unique method of capitalization was ultimately evolved; the gradual expansion of the industry was invariably sponsored and worked on capital secured from deposits made with the mill companies by the investing public, and not by share subscriptions. This prevented any over-capitalization, a practice which proved so disastrous in the post-war expansion of industries in other centres of India. It was the managing agency system that evolved and adopted this financing system in Ahmedabad, and the resulting prosperity assumes a new significance in the industrialization of the country, for it was the hereditary nature of the managing agency system that was responsible for the successful development and profitable working of the textile industry in Ahmedabad.

Capital-Labour Relations

Another important phase in the growth of the Ahmedabad textile industry relates to capital-labour relations. From very early days, Ahmedabad made serious efforts to face this problem, and in an industrial era abounding with ultra-democratic and socialistic ideas it has so handled the problem as to ensure smooth relations between these two agents of production, and even earn a tribute from the late head of the International Labour Office, Mr. Harold Butler For the first five decades the labour problem did not make itself felt; those were halcyon days when an abundant and cheap supply of labour was available mostly from the adjoining territories of Marwar and Kathiawar, the economic and industrial backwardness of which at that period always ensured an abundant supply of labour to the Ahmedabad textile industry. In the year 1917, however, the seeds of discontent were sown which in the next decade sprouted widespread. It began with an epidemic of plague when labour migrated in mass. Scarcity of labour was acutely felt in the later years of the Great War when there was hectic industrial activity; the industrialists vied with each other to secure and retain the requisite labour complements for their mills, and in the plenitude of war-time profits the labour wages were recklessly increased individually by mills in their over-anxiety to ensure a sufficient supply of labour for their mills. Thus, within a short period the standard of wages was brought

to a level out of parity with the normal capacity of the industry to bear such a burden.

The succeeding years (1919-20) brought home to everybody the stark reality of this abnormal situation; the millowners began to contemplate finding a way out of the intolerable situation. In the result, a general cut of 20 per cent. in the wages throughout the industry was declared in 1920 This decision of the millowners led to a memorable struggle with labour which was ultimately to change the whole aspect of the problem and mould the future of capital-labour relations in such a form as to spare the industry unnecessary internecine struggles. Gandhiji who was then staying in Ahmedabad (Sabarmati) espoused the cause of labour championed their counter-demand for an increase in wages, the demand being well-nigh impossible to concede, the millowners summarily rejected it and labour retaliated with a general strike, the biggest this industry had ever witnessed. The millowners explored all possible avenues of terminating this deadlock; weeks passed, and ultimately the workers gradually began to drift in and working conditions regained normality. Gandhiji then resorted to fasting till his plea for the cause of labour was conceded. The millowners were confronted with a dilemma unforeseen and distressing in its magnitude. Pressure was brought to bear upon them from all guarters in the country to save the situation and prevent a national tragedy, and they yielded. Ultimately, a way out of the impasse was found by the mutually agreed proposal to refer the dispute to arbitration. Thus was evolved a formula of arbitration which has since been accepted in all subsequent disputes; it heralded the dawn of a new era in capitallabour relations in Ahmedabad, and in the period of 20 years since its inception it has steered the industry safely through many grave crises Mr. Arno Pearse, the then Secretary of the International Cotton Federation, in his book, "The Cotton Industry of India," states: "The existence of a labour arbitration board has prevented in Ahmedabad strikes of lengthy periods whilst in Bombay two strikes of six months during the last two years (1927-29) have crippled the industry . . . "

Post-war Period

The end of the Great War found the Ahmedabad textile industry on the threshold of a new era, with alluring opportunities for its development and expansion. The post-war period saw at the helm of affairs a new generation of millowners who brought to their work scientific conception, methodical application, and dogged determination to put the industry on top. Their painstaking administrative direction and well-studied technical execution opened out a new vista of development for the industry and enabled it to compete with the advanced textile manufacturing countries. It also made Gujarat a formidable factor in all matters of moment concerning the trade and welfare of the nation; it amplified the voice of Gujarat in such vital matters as protective tariffs, Royal Commission deliberations, international trade parleys, and the administrative policy of the Government. Ahmedabad's accredited representatives and spokesmen were, for the first time, accorded a degree of respectful hearing not known before.

The factors which promoted the above successful achievement had their roots in the fruitful assimilation of the experience of the early days of trial and error, which had involved considerable expenditure on new equipment and study of modern methods and machinery, the careful consolidation of the large profits (Continued on p. 175)



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Mysore State—(Concluded from p. 167)

to study in detail the work in the Government farms and of private sericulturists. They were greatly impressed by the progress achieved in Mysore in the sericultural industry.

Handlooms: Khadi Production

Handloom weaving plays an important part in the economic life of over 30,000 people in the State. It is next in importance only to agriculture and sericulture. Twenty-five thousand looms are engaged in the production of pure cotton and pure woollen goods as well as goods mixed with artificial silk or mercerised yarns. These 30,000 weavers produce goods worth over Rs one crore every year.

The handloom weaving of wool is the hereditary and caste profession of particular communities and despite adverse conditions it has managed to survive the vicissitudes of the times by the timely succour of the Government. The wool spinning branch of the Badanval Spinning Centre of Kolar, since it was started in 1938, has now stabilized itself sufficiently to set idle looms into action to the benefit of hundreds of weavers.

The Badanval Spinning Centre, entirely the creation of the Government, is an instance of the regard paid to every aspect of national welfare in Mysore. The *khadi* produced by this centre has won high praise even from the All-India Spinners' Association. The *khadi* produced is not only sold to the public but also is used for the clothing of uniformed Government menials and other apparel of Government servants of certain classes. The progress of the khadi movement is well attested by the following facts. Its activities are now spread over 266 villages and towns. There are now 8,070 spinners and 511 looms working and the total annual sales exceed Rs. 1,06,000.

Raw Cotton Imports and Production

The cotton mills in Mysore State consume annually about 50,000 bales of cotton. In addition to about 11,500 bales of raw cotton raised in the State, Mysore imports on an average 47,000 bales of cotton every year. It has been estimated that the value of annual raw cotton imports is Rs. 60 lakhs. There are about twenty-one ginning and seven cotton pressing factories working and the number of bales pressed during the past year was 18,475.

It will be seen from above that there is considerable scope for the development of cotton cultivation in the State to meet the needs of one of the most vital key industries of the State. Therefore, the Government took a hand in the cultivation of cotton crop in the Irwin Canal area which offers fine scope, in view of the fact that this tract has an abundant water-supply. For the past three years or so the cotton crop was tested in the Irwin Canal Farm for its suitability to the conditions of this tract with its triennial system of irrigation of block rotation. Cotton crop was grown on a small area covering almost all the types of soil representative of the tract. In one particular field a yield of 995 lbs. per acre was achieved, which can be rated as a very high yield. Encouraged by this, cultivation was extended to several demonstration and trial plots of cultivators in the Mandya area, with the result that some of them have produced as high a yield as 850 lbs. per acre.

Another excellent example of the use of co-operative organization and principles to develop cotton farming is furnished by the Mardihalli Co-operative Society in

Chitaldrug District From humble beginnings, within a period of about ten years the membership has increased to several hundreds. The total quantity of cotton-in-seed collected and ginned is 60,800 maunds, the quantity of lint sold being 1,180 bales

With all the efforts made in Mysore for the enlarged cultivation of cotton, the State is still far from self-sufficient in this raw material requirement and the position will continue to be so for several years to come.

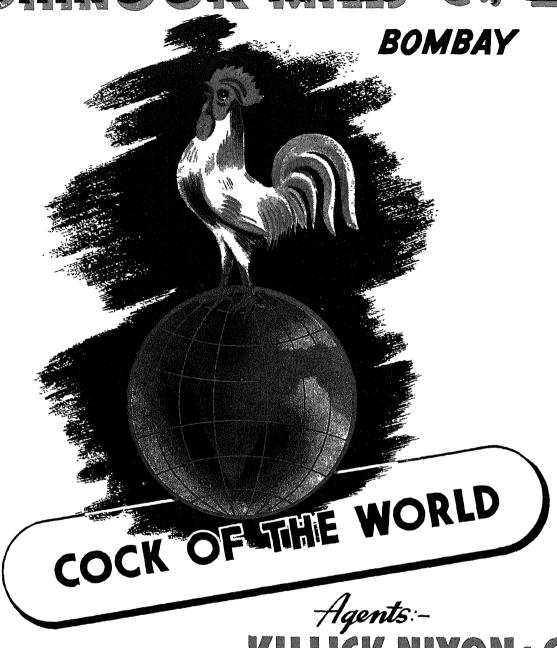
Ahmedabad-"The Bolton of the East"-

(Concluded from p. 173)

of the war period greatly helped this. With a boldness hitherto unknown, each new problem was tackled; for instance, the acute shortage of coal supplies experienced in the early twenties brought with it the realization of the disadvantages of an inland town, with the result that Ahmedabad ultimately developed and adopted a method of generating power according to the most approved engineering design and practice, with a standard of thermal efficiency which was very high compared to conditions in other manufacturing industries of India Further, the millowners appreciated the serious handicap of the antiquated machinery which prevented manufacturing profitably and competing favourably Without waiting to be told to put their house in order, the Ahmedabad millowners set about to gradually renovate and augment their manufacturing equipment, and a steady transformation has taken place in the short space of a decade Ahmedabad was the first to go in on a large scale for high-drafting in spinning, high-speed winding and warping, combing of cotton, etc. A decade ago, there were hardly a dozen combers in Ahmedabad; to-day the number stands twenty times over with most of them working double and triple shifts.

Likewise, Ahmedabad was quick to perceive the potentialities of the growing demand for better, finer, and more variegated products needed by the upper classes of the country. They boldly launched out to produce bleached and finished goods which were till then mostly unknown to the Indian textile industry; steadily but surely they set about causing the transformation of their industry from one producing very coarse and ordinary products into one turning out fine fabrics of rich texture. Between the years 1920-30, the hand bleaching (dhobi bleach) trade of Ahmedabad acquired a sound footing; the subsequent decade (1930-40) saw numerous large-scale installations of modern machinery for dyeing, bleaching, and finishing, until to-day some of the mills of Ahmedabad possess plant and equipment for such work which can vie in modernity and technique with that in other industrially advanced countries of the world; in the same period Ahmedabad also went in for machine printing of goods and succeeded in capturing a fair share of the market for the printed goods which India imported in large quantities. And this transformation of the "Darwen of India" into the "Bolton of the East" has been achieved within the short space of a decade and a half. A glowing tribute to this splendid achievement was paid by the Secretary of the Manchester Chamber of Commerce and Member of the Lancashire Trade Delegation to India, who observed: "If this is the Manchester of India, then all Manchester—the original—can do is to offer admiring and congratulatory salutations "

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NOTE ON THE TEXTILE INDUSTRY OF BARODA STATE

(Contributed)

Highness the late Maharaja Sir Sayajirao Gaekwar, the maker of modern Baroda, started several industries as State enterprises including one textile mill which was started in the year 1884 as a State concern with 17,000 mule spindles and 259 looms Being a State concern it could not make any appreciable progress and, therefore, it was sold to Sheth Zaverchand Laxmichand of Ahmedabad in the year 1905. Owing to the swadeshi movement and through able and economic management, the mill showed handsome profit in the very first year.

In view of the steady progress of that mill, Sheth Chimanlal Motilal, Shamal Bechar and Sheth Matubhai H. Kantawala were induced to start new mills. Their capital then was over-subscribed. Thereafter the number of mills in the State increased every year and the number rose from 11 in 1928-29 to 17 in the year 1938-39 During this period the capital invested showed an increase of nearly 150 per cent. The number of looms increased from 2,500 to 6,800 and spindles increased from 150,000 to 320,000. The quantity of yarn produced increased from 150 lakhs lbs. to 350 lakhs lbs approximately. And during this period there has been a tendency to produce more and more yarn of finer counts.

Sheth Matubhai H. Kantawala started the only woollen mill in the State, in the year 1920. Owing to the sudden death of Mr. Kantawala, it changed hands and was renamed Shree Dinesh Mills Ltd: it is now fully engaged in manufacturing blankets for the British Government, for war requirements.

The present Maharaja Pratapsinh Gaekwar is also taking great interest in the promotion of industries and a very bold policy has been laid down for attracting private capital to the State. Loans are being granted at a low rate of interest and concessions in water charges, income-tax, municipal octroi duty, land acquisition, etc., are always available

The following table illustrates the growth of the textile industry in Baroda:—

	1925-26	1930-31	1934-35	1939-40
Mills	12	13	15	16
Capital employed Spindles Looms Persons employed	Rs. 1,52,75,000 1,51,000 2,150 5,580	Rs 1,70,71,000 2,31,000 3,530 8,790	Rs 2,60,40,000 2,92,000 6,150	Rs. 3,28,03,000 3,32,000 7,110 20,650
- 1			1	

Cottage Industries

A good deal is also being done by the State for the development of cottage industries. Regarding handloom industry, new designs and varieties are being introduced. Cotton carpet is also being introduced on the handlooms. The production and sales of *khadi* have also been considerably increased in the last two years.

Cotton is the main crop of the State—25 per cent of the total area sown being under cotton crop (nearly 810,000 acres are under cotton out of nearly

3,300,000 acres sown). The best quality is the 1027 A.L.F. cotton, other types of note being B.D. 8, B.9, Mathio, and Wagad 8. About 230,000 bales of 400 lbs. each are produced annually A scheme for the field-to-field survey and elimination of Goghari seed (a short-staple variety) is in progress. Simultaneously a scheme for the improvement of Mathio cotton at Amreli is also under progress

There are two cotton markets managed by the State, one at Surat where lint cotton of the variety of 1027 A L F. is under transaction and the other for seed cotton of short staple at Bodeli. There is a Cotton Marketing Committee at Surat consisting of the Commissioner of Agriculture, Cotton Officer, Marketing Officer and Co-operative Registrar as also representatives of various groups and societies.

There are in the State 52 cotton ginning factories—32 in the Baroda District, 7 in Navsari, 11 in Mehsana and 2 in Amreli.

Other Industries

Apart from the textile industry, the State has got several other industries, some of them directly related to the textile industry. China-clay works have been started at Ransipur from 1934-35. The quantity of china-clay recovered and refined increased from about 280 tons in 1935-36 to 880 tons in 1938-39.

In the last two or three years two power-loom factories have been established at Billimora and one at Patan, weaving artificial silk partly or wholly. Another important industry is the Woodwork Factory at Navsari which manufactures bobbins, hanks, and other textile equipment. In two years its output has reached Rs 2 lakhs a year and it is able to sell its products outside the State itself to Bombay, Ahmedabad and Calcutta.

The Alembic Chemical Works Company, Limited, is one of the biggest chemical works in India. The Tatas have recently started the manufacture of heavy chemicals at Mithapur. A Sulphuric Acid factory has been started recently at Petlad. Other allied industries including those for manufacture of textile soaps are also being started.

The Federation of Baroda State Mills and Industries

The Federation of Baroda State Mills and Industries, Baroda, was established on 22nd April 1918 as the Baroda Millowners' Association, and has assumed its present name since 2nd May 1936. The main aims and objects of the Federation are to safeguard the interests of mills and industries, to establish unity and good relations amongst them and to ensure harmonious relations between capital and labour.

The Federation has at present on its rolls all the textile mills and almost all the big industries of the State. It has been recognized by the Government of Baroda and several of its members have been appointed to different institutions of the State, e.g., Dhara Sabha, Industries Board, Economic Board, Kala-Bhavan

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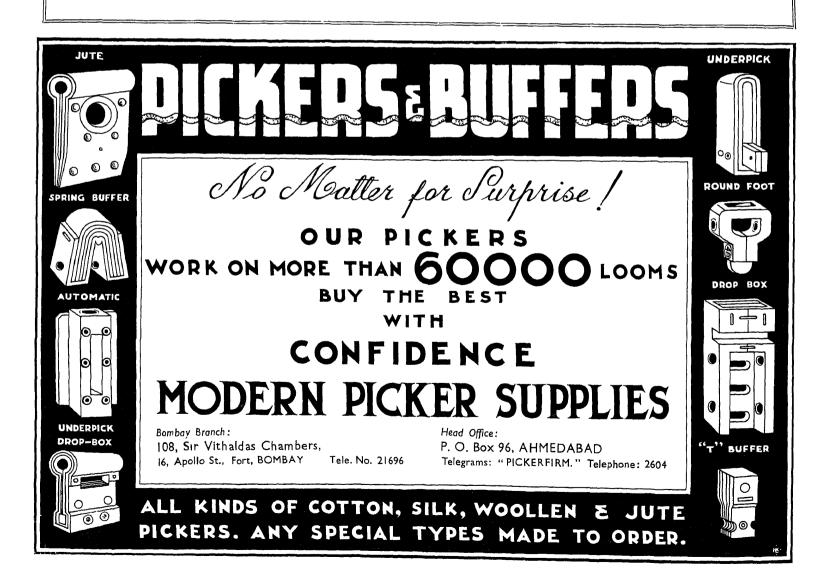
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THE TEXTILE INDUSTRY IN THE CENTRAL INDIA STATES

Βv

G. B. ZALANI, B.A., B.Com.

THE initiative in the promotion of cotton textile mills in the Holkar State was taken by the Holkar Government when, as early as in 1866, the first cotton mill, known as the State Mills, was started in Indore. This was at a time when the nearest railway was at Khandwa and the machinery had to be brought up and down the Vindya Range on the backs of camels and elephants! This mill was burnt down and a new mill in its place was again installed by the Government in 1883. The Indore Malwa United Mills Ltd., promoted by Sir Currimbhoy Ibrahim, came into existence in 1909. The third mill, the Hukamchand Mills Ltd., promoted by Sir Sarupchand Hukamchand, was started in 1914. The Swadeshi Cotton and Flour Mills Ltd., under the agency of Seth Mannalal Lachhiram, was started in 1921. The Kalyanmal Mills Ltd under the agency of Rai Bahadur Seth Tilokchand Kalyanmal, was started in 1923. The Nandlal Bhandarı Mılls Ltd., under the agency of Seth Nandlal Bhandarı, and the Rajkumar Mılls Ltd., under the agency of Sir Seth Sarupchand Hukamchand, were started in 1924. The Indore Malwa United Mills Ltd., and the Hukamchand Mills Ltd., each started additional mills in 1924 The State Mills have been taken over by Seth Kanhaıyalal Bhandarı of the Nandlal Bhandari Mills Ltd , and have been renamed Rai Bahadur Seth Kanhaiyalal Bhandarı Mılls. Some of the mills started working double shifts in 1932 and others in 1937. At present most of them are on night-shift work.

The following table shows the progress of the mills in the Holkar State.

Statement Showing the Progress of Cotton Mills in the Holkar State

Year	No of Mills	No of Spindles	No. of Looms	No. of hands employed	Cotton consum- ed in Bales approx-	Cloth produced lbs
1901 . 1910 . 1920 . 1930 . 1935 . 1939 .	2 3 7 7 7	10,272 30,299 69,578 1,64,663 2,06,509 2,02,007	224 865 2,430 5,244 5,850 6,274	500 2,291 5,030 12,730 15,203 21,281	1,700 4,170 31,580 99,100 112,420 138,340	5,80,000 14,81,000 105,72,000 270,59,000 372,46,000 469,67,000

In the year 1938 the total paid-up capital of the mills was Rs. 1,60,85,565, the block value Rs. 4,17,79,243, reserve fund Rs. 28,16,000 and profits Rs. 10,01,776.

All the mills run on medium counts and cater to up-country demands. The Punjab and the U.P. form an important consuming centre for the products of these mills.

In regard to labour legislation, the Holkar State is trying to keep pace with British India It has the Maternity Benefit Act, the Workmen's Compensation Act, the Trade Unions Act, the Trade Disputes Act, the Trade Disputes Conciliation Act, the Payment of Wages Act, etc. The Company Law too has been brought into line with that in British India.

There have been several attempts in the past to start a labour organization but they have not been successful. The latest organization, known as the Textile Labour Association (or the Mazdur Sangh), is more popular than any of its predecessors. It is also recognized by the Holkar Government As the Government takes keen interest in the smooth running of the industry many of the disputes in the industry are settled by the intervention of the Government itself.

Labour welfare work is limited only to mill dispensaries, creches, tea-stalls and grain depots for the workers, and other minor things. A housing scheme, to be started jointly by the Government and the millowners, is under contemplation

Cotton Cultivation

Cotton forms a very important crop in the Holkar State. Nearly 30 per cent. of the total area sown is under cotton. Compared to Provinces in British India the Holkar State stands sixth in importance. The major crop comes from the Nimad District and is of the Oomra type The rest is what is known as Malwi cotton and comes under the Broach type. But apart from this, attempts are being regularly made by Government to increase the area under staple varieties, and the districts of Khargone, Bhikamgam and Sanawad are found particularly suitable for the Verum and Upland qualities, while improved Malwi seeds of the Cambodia type have been successfully introduced in the Malwa districts.

The area under cotton is generally 600,000 acres and the yield comes to about 175,000 bales, out of which nearly half the cotton is consumed by the Indore mills in the Holkar State.

There are in the Holkar State 124 cotton ginning and 26 cotton pressing factories. There are in force a Cotton Ginning and Pressing Factories Act and a Cotton Transport Act.

There are in the Holkar State nine cotton markets controlled by Cotton Markets Committees for the direction of the cotton trade. These committees consist of one or two officials and representatives of cultivators, merchants, manufacturers and brokers, etc.

Handloom Industry

Handloom weaving is very common in Central India. But there are certain centres which are famous for this work. One such centre is Maheshwar in the Holkar State. The fine *saris* made by the Maheshwar handloom weaver are in great demand among high class families. There are at least 500 looms working in Maheshwar.

In order to help the weavers to get the required shades in dyed yarn and to acquaint them with the latest designs in weaving, the Government have started a demonstration factory at Maheshwar which is doing very useful work in guiding the workmen in manufacturing their goods. At this factory silk looms, dobbies, etc., etc., have been introduced and the handloom weavers have been instructed to change their looms

(Continued on p. 189)





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THE INDIAN MERCHANTS' CHAMBER, BOMBAY

Βv

J. K. MEHTA, M.A.

THE history of a country is nowadays not the history of its kings and queens, or of panoplied princes, but the history of its institutions, the history of the men who have built up its trade, commerce and industries, men who have cleared the slums and rescued suffering humanity from penury and distress, men who have worked at their ideals and have suffered for the same. The Indian Merchants' Chamber, Bombay, is one of those institutions in the country, which have made history in the world of trade, commerce and industries. A chamber of commerce is a Western institution, but it has found also its local habitation and name in Eastern countries and in ındıa, as there were analogous ınstitutions called Mahajans in this country. There was a big interregnum between India as she was and India as she is, and the interregnum was, as it were, a "No Man's Land." This country had a wealth of handicrafts and cottage industries and was well known, not throughout the East only, but also through several countries of the West for its splendid products, specially cotton textile products. Even 2,000 years back and earlier, there were highroads connecting Asia with Europe and the products from India were going on on those high roads to European countries, including Great Britain. However, all that slowly disappeared. We now come to a modern India, with her ancient arts and handicrafts disappearing, but eager to substitute in their place new arts and industries of the Machine Age. Her new industrial history began, perhaps, in about 1882 when cotton mills were first organized and established in this city, since which, despite several deterrent factors which have acted as handicaps, industrialization has been going on, though at a slow pace. During the last half century and more, big industries like cotton textiles, jute textiles, iron and steel, hydro-electric works, etc., have been established. India is placed on the list of prominent industrial countries by the International Labour Conference, which recognized also the part played by Indian industrialists in introducing labour legislation of an advanced character in this country in sympathy with its ideals. It was but natural that an industrially and commercially quickened India should have institutions to mould and guide the new feelings and aspirations and to organize Indian commercial and industrial opinion. This was specially necessary as, in the absence of such organizations, the voice of non-Indian institutions was held, perhaps naturally, to be the opinion of the Indian people. I still remember how some three or four decades back, when the question of the removal of the B. B. & C. I. Railway from Grant Road onwards to Colaba was in the air, foreign opinion favoured it and the Government of those days considered it as the opinion of Indians, though such an opinion was diametrically opposed to the same There were forces working at the time for a genuine expression of the soul of the country. The Indian National Congress was but recently organized, and side by side were working also institutions like the Indian Industrial Conference, Indian Social Conference, etc. The late Sir Munmohundas Ramji, Sir Purshotamdas Thakurdas, the late Sir Dinshaw

Wacha, Sır Ibrahım Rahımtoola, the late Sır Vıthaldas Thakersey and others moved, therefore, at the psychological moment when they started the Indian Merchants' Chamber in Bombay to organize the Indian commercial community on a proper basis and to focus Indian commercial opinion on the vital questions of the day. The Chamber did this and did also something more, which was to organize Indian Chambers of Commerce in other leading towns of commercial and industrial importance Soon, it was found that what the Chamber had done for the city of Bombay had to be done for the whole of the country, and that just as the political opinion of the country was attempted to be harnessed to a particular goal and particular ideal by the Indian National Congress, the commercial and industrial opinion also required to be centralized and focused, and this task the Chamber did by organizing the Indian Industrial and Commercial Congress which later on was transformed into what is now known as the Federation of Indian Chambers of Commerce and Industry When the history of the country comes to be written, the services of the Indian Merchants' Chamber will have to be mentioned as of an institution which contributed a large constructive quota to the building of the nation. Trade, commerce and industries were no longer allowed to be guided and moved from their goal under extraneous influences and a definite nationalistic bias was given to the commercial and industrial policy of the country and an Indian nationalistic economy came to be accepted. India had to toe the line to the Manchester school of economics, which was the accepted standard for those days—an economics which had led to the crippling of the country's trade, commerce and industries. All this was changed and a healthy feeling of rebellion was created against the obsessions and influences of the

It was but natural that, having been organized in the city of Bombay and associated from the very beginning with the cotton textile industry, the Chamber should have always paid special attention to various factors and questions in connection with this industry. The cotton textile industry had got its own association, which at the time was located in the office of the Bombay Chamber of Commerce. The Indian Chamber, however, from the very beginning took a bold and independent line of reasoning and always urged for high protection to the cotton textile industry and measures of discouragement to the foreign products which at the time had been inundating the land. The first Great War brought about changes in the Indian tariffs, and advantage was taken of this by institutions like the Chamber to press for greater and greater measure of protection Its evidence before the Indian Industrial Commission was in a way an exposition of the new ideas that had been moving the commercial community. The Chamber considered the currency and exchange policy of Government fraught with great mischief and even disaster to the Indian industries and the fight it waged in 1921 and the years which followed to get the currency and exchange policy of Government (Continued on p. 189)

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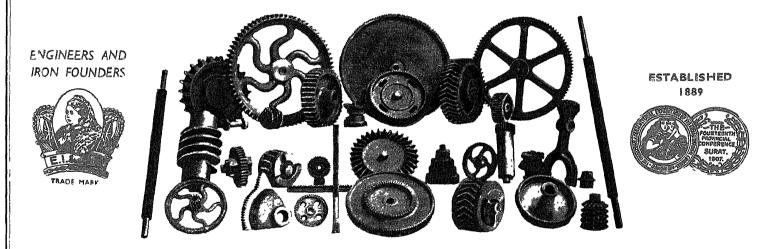
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COTTON IMPROVEMENT: WORK OF BOMBAY CHAMBER OF COMMERCE

LL through the history of the Bombay Chamber of Commerce, the one subject of trade above all others which has continuously occupied the attention of that body is cotton. From quite early days efforts at improving the quality, picking and cleaning of cotton and for putting down malpractices were being continuously carried on and the Chamber was in constant correspondence with analogous associations in England on this subject. As the result of co-operation between the Chamber and the Glasgow East India Association an improved cotton cleaning machine was invented by a Mr. Houldsworth and sent out to Bombay. It turned out, however, to be too heavy, complicated and costly for use in this country and experiments were continued with other machines.

In reply to an official request the Chamber in January 1841 submitted at great length their views on three points raised in a minute by the Governor-General, Lord Auckland, viz., (1) the improvement in staple of East India cotton, (2) the improvement in picking, cleaning and packing of cotton and (3) the extension of its cultivation so as to afford a larger supply for the manufactures of Great Britain, render her more independent of the American market and afford a channel for the employment of capital hitherto engaged in the opium trade.

As the result of representations by the Chamber and the Revenue Commissioner, a Government grant of Rs. 10,000 was made to the Collector of Ratnagiri, to enable him to conduct on a larger scale his experiments in the cultivation of Bourbon cotton. Samples of various superior cottons grown at Ratnagiri were exhibited at general meetings of the Chamber and reported upon. At the conclusion of meetings, lots of cotton were put up to auction and disposed of. The Chamber endeavoured to arrange the transmission to England, in quantity, of superior Broach cotton, small samples of which had already given satisfaction.

It was about this time that some American planters were sent out to India for the purpose of superintending experiments in cotton cultivation. Owing to mismanagement and the selection of unsuitable soils, the experiment was a complete failure as far as Bombay was concerned and the Americans there resigned Fearing that the effect of the failure would be to strengthen the native cultivator's aversion to any form of innovation, the Chamber memorialized the Court of Directors for the immediate resumption of the experiment and as a result two American planters were sent over from Madras and Bengal. It was anticipated that the repeal of the Corn Laws in 1846, by throwing open the markets of Great Britain, would offer America increased inducements to the more extended cultivation of other produce, thereby improving the prospects of demand for Indian

In reply to a reference from Government regarding the fraudulent adulteration of cotton, the Chamber expressed the opinion that the only effectual means of preventing the practice was by the appointment of inspectors to examine and stamp the cotton before shipment and by providing that the name of the owner and of the place of packing should be written in full on each bale as it came from the screws. This suggestion contains the germ of the Cotton Ginning and Pressing Factories Act passed 75 years later.

The decade, 189C-1900, opened auspiciously. The year 1891 was a bumper one for Bombay. The cotton crop was the second largest ever known and exports were much above the average. Shipments of wheat were the largest ever made and those of seeds, groundnuts and other produce were also heavy, so that total exports for the year reached Rs 41 crores, while the tonnage cleared from the port was nearly 50 per cent. over that of the two previous years. Bombay's trade with Japan had started in 1889 and in a few years cotton exports to that country exceeded a lakh of bales per annum. On the other hand, cotton exports to the Continent declined from a million bales in 1892 to under half a million in 1899, while those to the United Kingdom fell from 127,000 to almost nothing in the same period.

Protests Against Government Interference

Suggestions for legislation in connection with alleged frauds in the cotton trade and the deterioration of the staple having again been put forward in 1891, a special sub-committee composed of gentlemen of great experience in the cotton trade went very carefully into the whole question and furnished a lengthy report, on the basis of which the Chamber addressed Government in opposition to the proposals. The Chamber protested against every form of penal legislation or indeed any interference by Government with the ordinary course of trade, whether in connection with the growth, sale or shipment of the staple Recalling the previous history of the trade, the Chamber was able to show that the mixing of different descriptions of cotton had actually originated with the demand of European spinners for cheap supplies, and the style of standard samples and mode of arbitrations adopted by Liverpool arbitrators which facilitated the passing of mixed preparations. Favoured by plentiful supplies of cheap American cotton, Lancashire was steadily abandoning the spinning of low count yarns in favour of high counts made from long-stapled cotton which India did not produce, the requirements of the world in low counts being provided by an extended production of the Continent and in an enormous development of spinning and weaving in India. Basing their objections to legislation mainly on figures of the trade during the previous twenty years, the Chamber showed that while Liverpool's takings of Indian cotton had declined from 75 to under 6 per cent. of the season's receipts into Bombay, the Continent's share increased from 18 to 47 per cent, and the Bombay mills' share rose from under 5 to over 37 per cent. The Chamber also adduced figures of cotton cultivation in certain districts showing how the position had improved since the trade had been left to look after itself. The results went to show that there was no ground whatever for Government interference or special legislation either in the interest of the ryot, or for the protection of the revenue of the country.

Some years later the Chamber's views were fully endorsed both by the Government of Bombay and by

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the Secretary of State, who agreed that it was not desirable, in the interests of the Bombay cotton trade and of cotton production, to propose penal legislation against mixing different cottons, or against other questionable practices in the cotton trade. Competition and a prudent regard for their own interests on the part of all engaged in the production of, and trade in cotton would, Government thought, do more towards the utilization of the land to the best advantage than any aid from Government, and no action need be taken by Government in the matter beyond rendering such assistance, advice and information as the Agricultural Department could furnish The Secretary of State stated that he considered that the Bombay Chamber of Commerce had made a valuable contribution to the subject.

The Indian Cotton Committee

The Indian Cotton Committee of 1917-18 reviewed the position of cotton growing in India very thoroughly, and made a series of recommendations for the improvement of cotton growing and marketing, which proved to be of the greatest value. One of their recommendations was that a permanent All-India Committee should be established to promote the welfare of the cottongrowing industry generally, and, in particular, to advise the Government of India and Local Governments in regard to matters of cotton policy for the prevention of malpractices and similar matters. In 1923 the Cotton Cess Act was passed to provide funds for the work of the Indian Central Cotton Committee, as it was called, and for agricultural and technological research on cotton. The Cotton Transport Act, also passed in 1923, aimed at preventing the mixing of inferior grades of seed, cotton or cotton waste from one district with the superior cotton or seed of another. Prior to the passing of this Act inferior cottons were imported in large quantities into the staple cotton tracts for the purpose of adulteration; the results to the reputation of certain varieties of cotton and to the welfare of the cultivators were naturally disastrous. At this period a world shortage of cotton was predicted in certain circles, and it was, therefore, thought necessary that India should be in a position to supply her own mills with clean long-staple cotton. If she could produce a surplus that would be generally acceptable to cotton-consuming centres in other parts of the world, so much the better. Mr. V. A. Grantham and later Sir Joseph Kay put in a great deal of valuable work as the Chamber's representatives on the Indian Central Cotton Committee, while Sir Ness Wadia was prominent on the parent body, the Indian Cotton Committee.

The Cotton Contracts Committee was created under the Defence of India Act in 1918 as a temporary measure. This body was replaced by the Cotton Contracts Board in 1919 which continued to function until May 1922, when the Act under which the Board worked was repealed and its functions were entrusted to the East India Cotton Association under the Cotton Contracts Act of that year. In 1923 for the second year in succession there occurred one of the periodical crises that shake commercial Bombay to its foundations. As a result of a remarkably sharp advance in New York, the effects of which were aggravated in Bombay by the operations of a speculative section of the trade, business in the cotton market was virtually brought to a standstill for a fortnight in the busy season, when maximum rates for Broach (Rs. 700) had to be fixed. This crisis proved that the Act of 1922 was not sufficient, in the words of the Chamber's spokesman, "to dispel this pestilential miasma of speculation which is vitiating the whole commercial atmosphere." The Act was passed for three years in the first instance. In 1925 it was extended for a further period of five years.

In the same year was instituted a measure which the Chamber had advocated as long ago as 1850 as being the only effectual means of dealing with malpractices in the cotton trade. The Cotton Ginning and Pressing Factories Act, 1925, provided that every bale of cotton in British India should be marked with the mark of the press, the year and the serial number, thus enabling unsatisfactory cotton to be traced back to its source. This Act aimed, with the minimum of official interference, at placing the cotton trade in a position to protect itself from such malpractices as damping, mixing and adulteration, which were injuring the quality and reputation of Indian cotton. It was an All-India Act and had no real sanction behind it until the Bombay Amending Act was passed in 1935. In 1927 with the Chamber's approval a Bill was passed to provide for the establishment and better regulation of cotton markets in the Bombay Presidency.

After 1930

An attempt to repeal the Cotton Contracts Act in 1930 was strongly resisted by the Chamber which suggested that the opportunity of its renewal should be taken to introduce certain improvements, particularly in the arbitration system. The operation of the Act was extended for one year (afterwards for a further period up to 31st October 1932) and a representative Committee under Mr. G. Wiles, a Government officer, who as Chairman of the Cotton Contracts Board in 1919 had gained the confidence of the commercial world, was appointed to consider the working of the Act and make recommendations for its amendment. An attempt by the Government of Bombay in 1932 to give effect to the recommendations of the Wiles Committee, that the cotton trade in Bombay should be controlled by a single authority, was defeated by the Legislative Council's acceptance of the principle that, if necessary, more than one recognized association might concurrently be given the power to control dealings in cotton in

For some time past Bombay had been the centre of subversive political agitation, and the unfortunate introduction of politics into business had brought about the dislocation of the cotton market. In 1931 matters came to such a pass that European merchants and brokers were boycotted effectively, so far as actual cotton was concerned. The effect of the dislocation was felt not only by all sections of the trade, Indian, British and foreign but also by rural areas and up-country markets, which were deprived of a free market for their produce. Government, however, stepped in with a Bill which aimed at improving the regulation of the market in such a way as to secure free trading and to minimize outside interferences. Clauses 9 and 10 of the Bill gave Government special powers to deal with times of abnormal trade. While agreeing generally with the principle that Government interference with trade was undesirable, the Committee of the Chamber expressed the opinion that conditions in the cotton trade in Bombay had for some time past been such that the principle did not apply in this instance. After the adoption of certain amendments, some of which were suggested by the Chamber, the Bill was passed in September 1932 and came into force on 1st November. The period during which clauses 9 and 10

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should remain in force was limited to five years. The powers provided under these clauses have happily never had to be invoked. The assistance of the Chamber in carrying the measure through was publicly acknowledged by the Governor, Sir Frederick Sykes. The passing of the Cotton Contracts Act, 1932, and the existence of the emergency powers contained therein had an important effect in restoring general free trading in the cotton market shortly after.

In November 1935, a private Bill was introduced in the Bombay Legislative Council with the object of providing for unitary control in the cotton trade in Bombay While in favour of the principle of unitary control, the Chamber opposed the Bill as it sought to apply the criminal law to persons who did not trade with or through a recognized association Furthermore, the Chamber was doubtful whether the East India Cotton Association, the only association recognized at the time, would be in a position to regulate and control the trade to the satisfaction of all parties, even if it were vested with the powers contemplated in the Bill. Jointly with the Millowners' Association the Chamber urged the amendment of the constitution and by-laws of the East India Cotton Association, particularly in the matter of hedge contracts, surveys and appeals, ring trading, hours of trading and holidays, and fixation of spot rates. Conferences were held between representatives of the above bodies, Mr. C. P. Bramble acting as spokesman on behalf of the Chamber and the Millowners' Association. In the meantime the Bill before the Legislative Council was withdrawn. General trade in Bombay is so closely bound up with the healthy functioning of the cotton market that, in the past when the general interests of its members appeared to be affected, the Chamber has sometimes felt it a duty to intervene in matters more properly the concern of other associations. In future it should be to some extent relieved of such responsibilities by the recent formation of the Cotton Buyers' Association.

The foregoing account has been compiled from "100 Years of Bombay" by R J. F Sulivan, Secretary (1925-1937), the Chamber of Commerce, Bombay, on the occasion of its Centenary.

Indian Merchants' Chamber—(Concluded from p. 183)

changed and modified to suit the needs of the country was almost an epic one. The Fiscal Commission followed, and the policy of discriminating protection, as it was called, was adopted for the country. Then came the Royal Commission on Currency and Exchange, and with regard to all these questions the Chamber contributed its full quota of thought and work. The cotton textile industry, the Chamber thought, and rightly so, would be most affected by any adverse steps Government took in their currency and exchange policy, and so it waged a big fight against any shortsighted and reactionary steps Government might take. The Chamber also considered that industrialization of the country could not be proceeded with unless there were reasonable measures of labour legislation, and the pronouncements of the Chamber with regard to labour legislation whenever it was consulted came to be considered as pronouncements of no mean value and as being far-sighted, considerate and sympathetic The Indian Merchants' Chamber has now been associated with trade, commerce and industries for the last 33 years, and it may well be said that its services to the cause it represents are of no mean order.

The Textile Industry in the Central India States-

(Concluded from p. 179)

from the throw shuttle to the fly shuttle type, in order to increase production.

Institute of Plant Industry, Indore

Situated at Indore is the Institute of Plant Industry, whose main task is research in cotton on the one hand and helping the Agricultural Departments of the contributing Central Indian States in the development of agriculture on scientific lines on the other.

The Institute carried out laboratory and field experiments to study the genetical, cytological and physiological factors of the Indian and American cottons. Several experiments, *re.* wilt resistance, competition effects, etc., and experiments in manuring the various cottons have been carried out by the Institute.

The Institute has evolved two strains of cotton, viz., M 9 and 9-20 which are stated to be most suited in respect of staple, outturn, blow-room loss, etc., to the conditions that prevail in Central India

GWALIOR STATE

THE Gwalior State is divided into two "Prants" (Provinces), viz., the Gwalior and the Malwa *Prants*. The latter is the "Berar" of the Gwalior State inasmuch as it is the chief area for cotton. The Malwa Prant has four districts, viz., Ujjain, Amjhera, Mandsaur and Shajapur.

The area under cotton cultivation in the Gwalior State is about 10 per cent. of the total area under cultivation. The approximate figures are as follows:—

							Bighas
Total area under cult	ivation	ın the	whole	State		• •	1,13,00,000
Area under cotton ·							
Gwalior Prant			• •			,300	
Malwa Prant	• •	• •	• •	• •	12,30	,300	
							12,87,600

The Gwalior State also produces other fibres: those under flax and hemp being about a lakh of *bighas*, and the production thereof being about 175,000 maunds.

There are 122 cotton ginning and 22 cotton pressing factories in the State, nearly all of which are in the Malwa Prant.

The oldest mill in the State is the Cotton Ginning, Spinning and Weaving Mills, known as Nazaralli Mills, with 17,200 spindles and 379 looms. This was a proprietary concern started by Seth Nazarali and employing Rs 26,00,000 as capital There are three other cotton mills at Ujjain, viz., the Binod Mills Company Limited and the Deepchand Mills (formerly known as Sipra Cotton Mill), both under the agency of Seth Binodiram Balchand, and having together 51,000 spindles and 1,300 looms. The third mill at Ujjain is the Hira Mills Ltd., under the agency of Sir Sarupchand Hukamchand & Co., having 26,000 spindles and 864 looms

There are two more mills at Gwalior, viz., the Jiyajirao Cotton Mills Ltd. under Messrs. Birla Brothers having 38,000 spindles, and 1,400 looms; and Motilal Agrawal Mills (Agent: Lala Mithanlal Agrawal) with 15,000 spindles, this being a spinning mill only.

These mills run on medium counts and cater to local demand and also to U.P. and the Punjab markets. Of late they have also been working on Government orders.

Gwallor State has some famous handloom centres, those at Chanderi and Sarangpur being well known for their fine work.

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THE INDIAN CHAMBER OF COMMERCE, CALCUTTA

(Contributed)

THE Indian Chamber of Commerce, Calcutta, which occupies an important place to-day in the commercial life of the country, was formally inaugurated on the 30th January 1926, that is, less than 15 years ago. Mr. G. D. Birla was the first President of the Chamber, the first Senior Vice-President being Mr. Anandji Haridas. The ideals which the promoters of this institution had before them in establishing the Chamber can best be expressed in the words of Mr. Anandji Haridas, who said: "We in Calcutta have had to be impressed with the value of organization in commercial life. We lack the vision that both for self-defence and for self-assertion, we need to organize ourselves."

Thanks to the co-operation of all sections of the Indian commercial community, the Chamber soon grew into an important commercial organization and made its influence felt in all directions. Starting with 62 members on its roll on the day of the first meeting, the membership of the Chamber rose to 182 by the close of the first year of its existence. Within a year of its formation, the Chamber secured representation on the Calcutta Port Trust, one of the most important statutory bodies in the Province. The Chamber was also asked during the year to suggest names for the nomination of a member to the Bengal Nagpur Railway Local Advisory Committee. As years went by, the importance and status of the Chamber was recognized by the Provincial and the Central Governments. On the Provincial Legislature being reconstituted under the Government of India Act of 1935, the Chamber was given a statutory right to elect a member to the Bengal Legislative Assembly. The Chamber's name is also included in the Electoral College for the purpose of election of one representative from Bengal to represent Indian commerce in the Federal Assembly under the new Constitution.

Apart from the Provincial Assembly and the Calcutta Port Trust, the Chamber at present enjoys the privilege of sending representatives to all the three local Railway Advisory Committees, the Indian Central Jute Committee, the Provincial Board of Apprenticeship Training, the Board of Economic Inquiry, Bengal, the Traffic Advisory Board, the Government Commercial Institute Board, the Board of Scientific Research, Bengal, the Provincial Advisory Board on Indian Forest Utilization for Bengal, the Bengal Smoke Nuisances Commission, the Bengal Boilers Attendants Examiners Board, the Provincial War Supplies Board, etc. The Chamber is also represented on the Commercial Panel of the Railway Rates Advisory Committee and on various other public institutions connected with the Corporation and the Government.

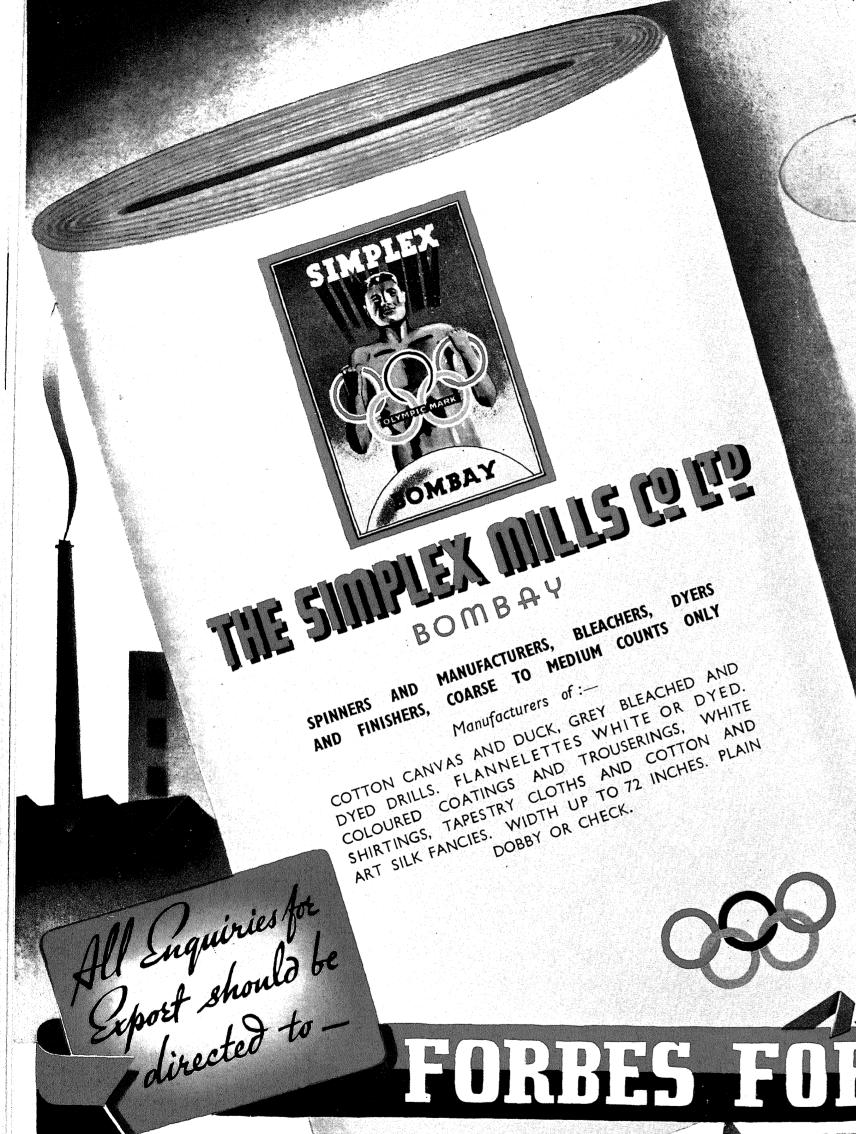
Ever since its inception, the Chamber has taken an active part in promoting the interests of the cotton textile industry. Within a few months of its formation, the Chamber submitted a memorandum to the Tariff Board (Cotton Textile Industry Inquiry) setting forth their case for the grant of protection to the Indian cotton textile industry. Again, in 1933, when the cotton textile

industry was suffering from a severe slump and competition from Japanese piecegoods, the Chamber moved the Government of India for immediate action to protect the indigenous industry. The Chamber also opposed the Bombay-Lancashire Trade Agreement regarding the reduction of import duty on Lancashire piecegoods. As a matter of fact, one of its most active members and an ex-President of the Chamber, Mr. D. P Khaitan, has been chosen by the Federation of Indian Chambers of Commerce and Industry on all the three occasions to be one of the unofficial advisers to the Government of India's delegation in connection with the Indo-Japanese trade negotiations, and the part taken by Mr. G. D. Birla, another ex-President of the Chamber as one of the unofficial advisers to the Government Delegation in connection with the recent Indo-British Trade Agreement, is well known.

Among the important auxiliary activities of the Chamber may be mentioned the establishment of a Tribunal of Arbitration for the settlement of disputes. The Tribunal was appointed in 1927 and had since then to deal with disputes in various different trades, for example, jute, gunnies, piecegoods and yarn, iron and steel, coal, sugar and general. The Chamber also undertakes survey and sampling of goods and issues certificates of origin.

The Chamber has played a very important part in another direction. It took a leading part in organizing several important industries including sugar, chemicals, general insurance and paper, etc. At present the Chamber has got as many as 17 affiliated organizations, the most important among them being the Indian Sugar Mills Association, the Indian Chemical Manufacturers Association, the East India Jute Association, the Indian Produce Association, the Jute Balers' Association, the Indian Tea Merchants' Association, the Indian Colliery Owners' Association, the Indian Paper Mills Association, the Indian Insurance Companies' Association, Calcutta Kirana Association, the Gunny Trades Association and the Calcutta Tube Importers' Association.

The Chamber to-day represents in its membership Indian capital worth more than Rs. 400 crores. A recent enquiry also showed that almost 30 per cent. of the trade passing through the Port of Calcutta is handled through industrial and business concerns connected with the Chamber. The Chamber also includes within its affiliation and membership the whole of sugar, cement and chemical industries and a considerable part of the paper industry. It may also be mentioned that the Indian Chamber of Commerce has represented and continues to represent all sections of the Indian commercial community. Hindus, Muslims and Parsis both from within and outside Bengal are represented in the Chamber. In brief, it may be said that during a short period of 15 years of its existence, the Indian Chamber of Commerce, Calcutta, has come to fill an important place in the commercial life of the country, particularly in Bengal.



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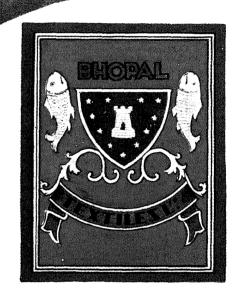
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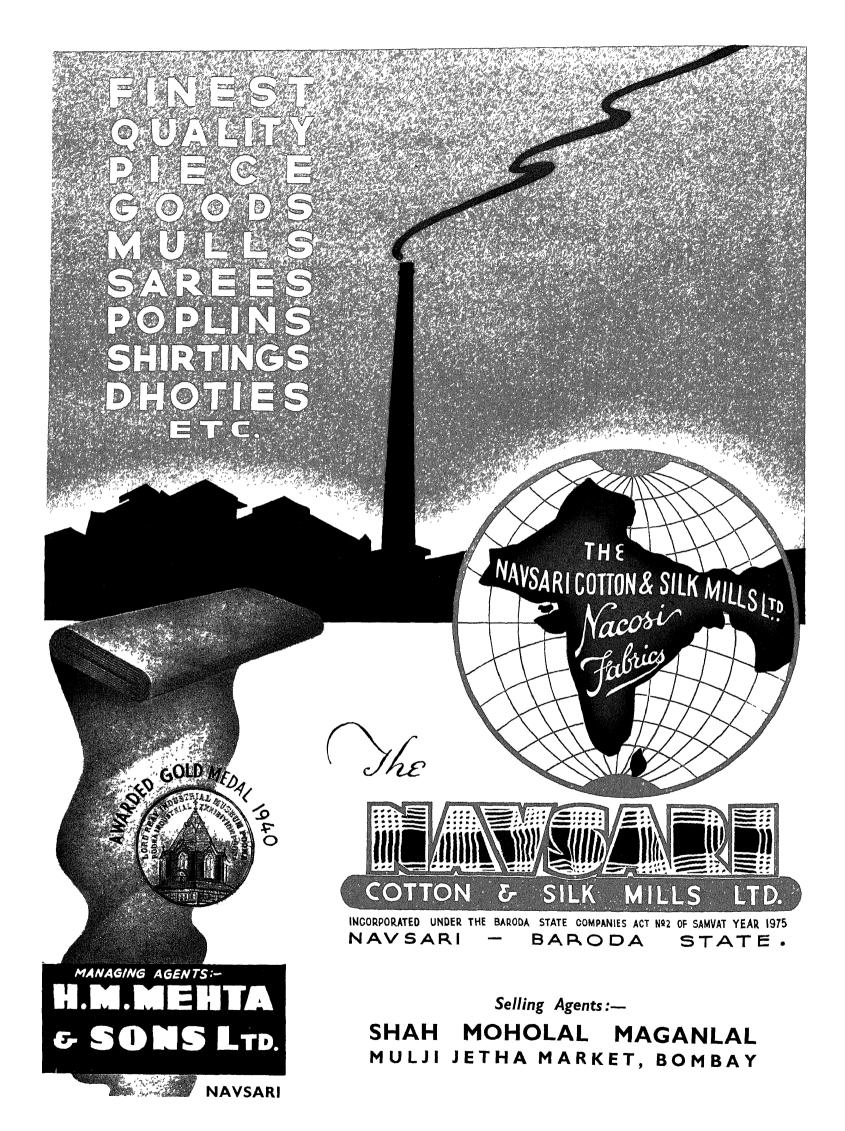
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THE BOMBAY EUROPEAN TEXTILE ASSOCIATION REMINISCENCES AND RECOLLECTIONS

The veteran members of the "BE.TA" who have contributed the articles that follow have very ably dealt with nearly all the principal features of interest in an attractive and amusing way and we are grateful to them for their kindness in assisting us despite the fact they are always busy and have little time to spare for such pleasures as writing articles for publication—Ed

THE ASSOCIATION AND ITS ACTIVITIES

By J. A. SUTTON

THE Bombay European Textile Association is the premier organization in India of Europeans employed in the textile industry, directly or indirectly. It was founded in 1919 when the industry was not organized so well as it is now and when it was going through a period of acute crisis on account of labour troubles, strikes and riots. The operatives and other working classes were commencing to organize themselves into trade unions and labour associations; the millowners had formed themselves into an association to protect and safeguard their common interests. But, the Europeans engaged in the management of the mills and holding responsible administrative positions had themselves no organization to protect their interests and provide a meeting ground for mutual benefit.

It was under such conditions that the idea occurred to several old members that an association of Europeans employed in the various branches of the industry would be of interest to the industry itself and beneficial to themselves. With this object, a few friends such as Messrs. J. Addyman, J. B. Green, H. Guthrie, J. F. Allanson, H. Hargreaves, A. Parry, James Taylor, Henry Gannon, H. Aspden and others met at the bungalow of Mr. H. Guthrie at Mazagon to discuss the feasibility of the project and formulate a scheme for the formation of an association having for its object "the protection of the mutual interests of its members and the advancement of the industry chiefly'' The latter object was noteworthy masmuch as it demonstrates clearly that the founders had identified themselves with the industry in which they were engaged, and, far from being a trade union in the technical sense of the term, the Association held before it as its primary object the advancement of the industry with which is closely bound up the economic welfare of the country in large measure. For the definition of this far-sighted aim, a large measure of credit is due to the Founders of the Association who held before themselves a higher and nobler object than the promotion of the common interests of the members.

The response to the Founders' appeal was magnanimous and, within the first few months, over 200 European employees in the industry had enrolled themselves as members of the Association. All down the years, the Association has held its own and its work has steadily increased, both in value and volume, despite the trying times through which the industry passed during the twenties and the early thirties which culminated in the crash of the Currimbhoy group of mills in 1932 which dispersed many of the valued members to all parts of the country. The Association has now 170 members on its rolls. Its work has in no way diminished. It has

endeavoured to maintain its reputation and expand its sphere of usefulness, and attempted to promote the advancement of the industry in every practicable manner

The Association seeks to fulfil its primary aims and objects (1) by meeting together for the discussion of subjects relating to the industry, (2) by unity of opinion and action towards the achievement of objects that individual action and opinion is powerless to attain, and (3) by offering knowledge, information and advice in such matters by the provision of expert and experienced officials as representatives on Government Commissions, select committees of inquiry and other bodies, whether appointed by Government, the textile industry or otherwise, or as witnesses before any such commissions and committees with reference to legislation affecting the industry and all matters affecting the general policy, welfare and status of the textile industry.

The activities of the Association designed to promote the welfare of its members may be broadly grouped under four heads. (1) The Benevolent Fund scheme, (2) the organization of social events, (3) the sick visiting committee, and (4) monthly general meetings

The Benevolent Fund scheme is a notable feature of the Association It is a sort of short-circuited limited insurance and distress relief scheme under which, in the case of the death of a member participating in the scheme, his nominee is entitled to a contribution of a sum of £100 from the Fund. It also assists a member in distress by an immediate grant of a sum not exceeding Rs. 200. The Fund has now a sum of over Rs. 30,000 to its credit which is invested in Government securities. Its administration and maintenance are vested in the Committee of the Association.

The organization of social functions which offer an informal meeting ground for all members is a regular feature. The annual tennis events and the Xmas functions are looked forward to with keen interest. Apart from these permanent fixtures, smoking concerts, whist drives and dances are organized periodically on suitable opportunities. These occasions keep alive the spirit of *camaraderie* and good fellowship.

The Sick Visiting Committee is a happy feature, thoughtfully introduced. Every month, on the occasion of the general meeting, three members volunteer for this service and they visit sick members and endeavour to be of assistance and comfort to them in their sickness. They report to the general body at the monthly meeting which follows up suitably in cases of need and distress. Among a community of men, living and working in a country six thousand miles away from their kith and kin, it is difficult to think of a more useful service.

The Association holds a general meeting every month. This constitutes a forum for all the members. Members with specialized knowledge and foreign visitors possessing special interest in the operations of

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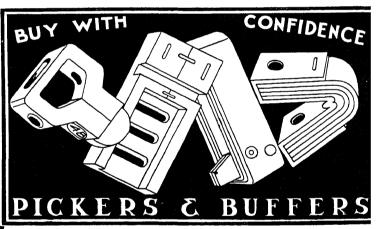
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(Signed) S. N. BOSE, Wvg Master, Shri Ramkrishna Mills, Ltd., Ahmedabad.

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the textile industry are invited to deliver lectures or read papers on subjects of technical importance. These general meetings not only afford members valuable opportunities for the mutual exchange of ideas and experiences but also assist them in keeping themselves abreast of modern ideas and developments in technique

The Association takes an enlightened interest in all matters affecting the textile industry and actively associates itself with the shaping of legislation concerning its welfare. Both the Government of India and the Provincial Government refer to the Association for its views all Bills having a bearing on the development of the industry. The period under review has witnessed a mass of industrial legislation relating to mill management and labour welfare. The Association was consulted on all of them and it submitted its views on the Bills that were under contemplation.

The Association is represented on the Committee of the European Association (Bombay Branch) and close liaison exists between the two. Both the bodies act in mutual collaboration regarding matters of common interest.

The Association has taken an active part in the war efforts. It was the first non-official institution to start a monthly War Gifts Fund to which members contribute every month. So far the Association has sent "Home" direct to His Majesty's Government as free gift a sum of over Rs. 10,000.

THE LAST TWENTY YEARS By W. TAYLOR

THE latter part of the year 1919 was my first introduction to India, and the textile industry in Bombay was in a good position due to the last war. Profits were satisfactory and bonuses were paid to workmen and staff. In those days the average count of yarn in cloth was approximately 24s, and a large production of sale yarn in the counts of 12½s, 16s and 20s kept a good number of spindles employed. The cloth produced was of a low quality, round about 44 reeds and 44 picks, and, provided the appearance was not too bad and the weight was somewhere about what it was intended to be, it was, on the whole, generally accepted

The amount of coloured yarn used in the making of fabrics was very little compared to the present day. As time went on and competition from abroad and up-country became keener it was obvious that the old easy way of working was gradually drawing to a close. The demand was for better and cheaper cloth. This in turn brought about great changes. Changes in machinery, changes in ideas, changes in labour, changes in technical personnel, etc., and all these changes demanded that everything must be better.

The age of the old mule was very quickly brought to a close; the ring spinning frame, which was already in existence, completely wiped out the age of the mule. The preparatory machinery was brought up to a more efficient state in handling cotton, and more attention was given to the number of cards per preparation. During the whole of this time the yarns demanded in cloth were gradually going finer, and we had about reached the 40s stage. The woven fabrics improved and the industry was forced to keep abreast of imported styles. The borders of saris and dhotis had to be more attractive and the yarns used in the borders had to have greater fastness

to washing, bleaching, etc. The keenness of competition affected considerably the position of labour, and the industry was faced with a complete survey of its labour force. This survey was somewhat responsible for what is known in managerial circles as the "Rationalisation Scheme," and, as individual mills attempted to introduce this scheme, labour troubles became general and resulted in big strikes in the years 1928, 1929, 1930, and a little in 1931 During this period the management of mills was very severely tried, and many anxious months were passed. While these times were definitely very serious ones, many amusing methods were practised by certain managers in defeating the activities of the strikers at the mill gates. As time passed the movement was gaining ground at a very rapid pace. In the spinning section of the industry, modern improvements in blow-room, still better carding, and high draft systems were no longer considered as subjects for discussion but were recognized as definite necessities to fight the ever increasing competition. The sale yarn section of the industry tackled the multifold yarn field, and no doubt achieved considerable success. The cloth section of the industry was in like manner called upon to make still greater efforts to produce more attractive fabrics; this entailed, in many cases, the adoption of more modern methods in winding, warping and sizing. Here we find mill executives searching for better methods for preparing yarns for the weaver. Sizing was being scientifically studied, and thermostatic control was discussed and adopted Better control of humidity also came within the sphere for better working and, eventually ending up with complete air control, it has an essential significance for the manufacture of better fabrics.

These fabrics in turn open a field in which the " finishing " part of the trade had to be seriously tackled. No longer would any sort of a finish to give weight be accepted No longer would the old way of dyeing cloth and yarn be tolerated. Here again managements were called on to compete with imported styles, up-to date dyeing plants were installed and the latest bleaching plants were erected The water at the disposal of the mills had to be analysed, and in many cases water softening plants were erected to satisfy the demands of the market. Still the race of progress continued, and still further demands were made. The san cloth section no longer was satisfied with 16 shafts dobby work, more attractive borders were demanded and 40 shafts and jacquard designs became the order of the day. This again in turn developed another field which demanded serious thought, and that was designing. Young men with artistic leanings and knowledge of fabric construction were required. What a change from the old Calcutta dhotis of the early twenties, when all that was demanded was a $\frac{5}{8}$ inch plain border in half a dozen shades, the dyeing of which was, to say the least, very primitive!

As the industry was now in its full march to satisfy the never-ending demand for cheaper and better cloth the whole tendency was for fabrics to go finer in quality. As we have seen that in the early twenties the average cloth was constructed from average yarn of 24s counts, we find in the early thirties that Indianmade cloth was being made in fairly large quantities with average yarns of 70s, 80s, 90s and 100s. To people not familiar with the industry this will convey very little, but to those who have knowledge of textiles it will convey a great deal. To produce fabrics with yarns containing the above counts opens a field which is very different from the coarse fabrics styles. Again, the

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NEW QUEEN'S ROAD, BOMBAY 4 AND AT CALCUTTA, DELHI, LAHORE AND MADRAS section of the industry which tackled the "fine trade" had once more to provide ways and means to satisfy the demands for finer fabrics. The mills entering this field came up against a very difficult problem; their existing plants in many cases were suitable only for short-staple cotton, while the field they intended to attack was of long-staple cotton. This involved a complete transformation in the whole of their existing equipments, plus the introduction of combers and other machines necessary for handling long-staple cotton and producing fine cloth. Therefore cloths which had till then been the sole monopoly of Lancashire gradually appeared in the market made entirely in India, Cloths such as voiles, cambrics, lawns, poplins, fine shirting, fine dhotis and saris, nainsooks, etc., began to be sold under the stamp of "Spun and Woven" ın India. In my opinion this fact alone speaks volumes for the progress made during the last 20 years, especially in view of the fact that in a comparatively short space of time, India had successfully made fabrics of a quality and price suited to a market which had for a large number of years been in the hands of a very capable and formidable competitor. In the twenties pieces of cloth were very crudely stamped and baled up in a bale and accepted in such a state, but now the trade demands very careful make-up which includes very clear impressions, high class ticketing, cellophane wrappers, and wooden cases.

During the whole of this period the operative has not been neglected, in fact he has also benefited by the progress of time. His hours are shorter, his wages are higher, and he enjoys the benefits of welfare schemes in many forms. He has at his disposal a creche for his children, a free dispensary, maternity benefits, and rules governing leave of absence, which are all intended to create a happy and contented labour force.

The industry has not forgotten a very important item, and that is the provision of technically trained personnel on whom, in the future, the responsibility for advancement will lie. Many mills have apprentice schemes whereby young men of higher education are taken and trained so that they in turn will one day be capable of filling executive positions.

PROGRESS IN PROCESSING

By HENRY GANNON

THE mid-nineties when I arrived in India saw Bombay in a more or less primitive state. The vast bulk of the trade was in low count China yarn when the cotton was simply pushed through the process. Most of the mills had in the blow-room, say, double Crighton opener (sometimes with the old crude porcupine feed) and three lines of scutchers. There were no hopper feeders which were introduced in England in the early nineties by Hetheringtons. Flat cards were already general; only a few roller cards were used on the lowest counts. Ring frames had ousted flyer throstles (which latter, I gather, had never been popular in Indian mills) and for China yarns the mule was more favoured than rings. Of course, there were no "refinements" on any of the machines in those days

However, some millowners had already gone all out for ring frames a considerable time before my arrival, the David No. 1 Mill, Bombay, being built in 1888 with 30,000 ring spindles. Nevertheless, when

No. 2 was erected in 1899 about half the spindles were mule—no weaving, of course.

The mills that followed about the time I landed followed the same system and the Kohinoor Mill, Bombay, erected about 1898, was going on nearly half mule spindles. The theory was that a cheaper mixing could be used for mules for a given count, especially low counts

Shortly after the turn of the century the mule rapidly fell out of favour with the result that practically all mills installed rings both for reeling yarns and weaving. The first was Finlay Mills in 1907 with 40,000 spindles and weaving. Here I might mention that the Textile Mill went up in about 1897 with all ring spindles, but weaving was in mind.

When I landed, rings had already been installed in mills for weaving. This transition evidently took place when the ring frame was generally introduced towards the end of the eighties. Those early frames were equipped with the original Rabbeth spindle with a brass liner—no inner tube

Now as regards weaving. This was primitive to a degree in Bombay; mill agents were essentially concerned with China yarn which were easily produced, and sales for 10,000 bales or so at a time in one or two counts were the vogue Most of the concerns simply turned out a low grey "sheeting" which passed through the folding machine and then baled up

The first calenders, 4-bowl-cum-19-cylinder finishing machines, had just been introduced in one or two mills. Dyeing in the modern sense did not exist; when colours were introduced there were the wood dye vats for yarn. However, I did note that the Petit group of mills did make something more of weaving and made a commencement in "fancies," that is, mostly broadcloth with coloured stripes. Nowrosjee Wadia was Superintendent and I should conclude he had only weaving in mind when he made his first essay and built the Textile Mills about the year 1897, following 2-3 years with the Century Mill, also weaving. Certainly Wadias were not running after the China yarn business.

There were some dobby work and also some old-fashioned drop box looms. The Eccles drop box came along first at the end of the nineties. With the great fall in yarn export, the spinning mills were forced on to weaving with the result that many sheds went up in 1900-10. Naturally, there was not "room" for all of them on the plain greys with the result that better grades had to be produced calling for finishing processes, etc. Speaking from memory, the first large-scale bleaching, dyeing and finishing plant, on modern lines, was installed at the Khatau Makanji Mill some 35 years ago. The Manockjee Petit Mill soon followed with a similar plant.

As concerns up-country mills, there in the main were both spinning and weaving. They could not compete for the vast China yarn trade.

It is interesting to note that in those early days Ahmedabad sheds produced a superior yarn and cloth as compared with Bombay This was due to the fact that they were concerned greatly with the *dhoti* trade calling for better yarn and weaving. These mills were the principal buyers of the best Surat cottons for such *dhotis*. I can still remember the first calender in Ahmedabad, installed by Rileys, and a 4-bowl one.

From the foregoing notes it will be possible to follow the broad transition from elementary coarse grey cloths to what is produced in these days. It is truly astonishing. Ever since the last war, when Manchester (Continued on p. 317)

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COTTON MILL STAFF IN BOMBAY

Ву

G. N. VAIDYA, M.A., LL.B.

Editor of Textile Digest, the official organ of the Textile Association (India), Bombay.

THE changes in the composition and outlook of the technical and supervisory staff employed in the textile mills of Bombay are remarkable. To view these changes in their proper perspective it is necessary to go back to the foundations of this great industry in Bombay about 1854.

Parsi Pioneers

Early in 1854, an enterprising Parsi merchant, Mr. Cowasji Nanabhoy Davar, maugurated the pioneer spinning factory of Bombay, the Bombay Spinning and Weaving Company. Messrs. Platt Brothers, the wellknown British machinery makers, offered advice and suggestions as regards the design of the mill building and the detailed specifications of the machinery. They also sent English erectors, carders and spinners to erect the machinery and to train workers in its manipulation. The superior staff in the pioneer mills was thus exclusively European. These people were mostly fitters, experienced in work but usually not very educated. The workers were mostly Konkani Marathas, intelligent but illiterate. The necessity for a class of subordinate staff, to act as interpreters between the English officers and the Indian workers, was keenly felt. The Parsis filled this role admirably. They grasped the English language very quickly and from amongst all the different classes of Indians, they most nearly approached the Europeans in habits and ways of living They had the unique capacity of adjusting themselves to different environments. They were not afraid of hard work and had a natural push which carried them very far in industrial progress. Moreover, most of the earlier millowners were Parsis and they very naturally introduced their kith and kin in this new enterprise. Amongst other communities, and notably amongst middle-class Hindus of the higher order, manual work was considered degrading and mill-work was looked upon as something beneath the dignity of a caste Hindu. The Parsis by their proper appreciation of the dignity of work, soon made remarkable strides in the mill organization of the earlier days, and by implicit obedience judiciously punctuated by tact, soon proved to be very efficient disciples of the European staff, which was mostly deputed by machine makers. The difficulties of these pioneers were many. The European officers who were the teachers, could demonstrate, but seldom explain; text-books were not available; but by patient perseverance, these Parsi assistants soon grasped the unfamiliar technique of manipulating such complicated machinery.

The nature of the work was also then much simpler than it is to-day. Mills spun only a few counts and manufactured only a limited number of cloths. There was very little competition and mills, with the ordinary prudence to keep aloof from speculation, were able to show profits. The Lancashire system of specialization, wherein a carder was an excellent carder but nothing more, was therefore found quite suitable. If the means of improving one's general knowledge were meagre, the

duties did not make any heavy demands on detailed theoretical and general knowledge. The calculations were of the most elementary nature and rule-of-thumb methods held sway. Even after spending years in a cotton mill, a man was not expected to know anything outside his own section

Some of these inherent defects were felt very keenly by the millowners. The technical staff always had a tendency to make much of their "secrets" which in reality were based on mere elementary calculations and observation. It was soon felt that regular instruction on scientific lines could teach the apprentices much better than leaving them to pick up what a superior member of the staff chose to explain. Many a time, practical people, very skilful at their job, and with the best of intentions to coach their subordinates, were unable to do so because of the lack of a grounding in mechanics and calculations.

The V. J. T. Institute

About the year 1890, two important events helped to change these conditions. The first was the establishment in 1889 of the Victoria Jubilee Technical Institute to train students in textile manufacture and mechanical and electrical engineering. Here again, wealthy Parsis connected with the mill-industry came forward with munificent donations Sir Dinshaw Petit, the first Baronet, donated Rs. 3,00,000 for the building and Rs 46,000 were contributed by the Sir Jamsetji Jeejeebhoy (2nd Baronet) Memorial Fund. Mr. N N Wadia, C.I.E., rendered very valuable service by contributing the best of his time, energy and expert knowledge of textile and engineering factories. The Ripon Textile school of the Institute was endowed with Rs. 1,50,000 from the Ripon Memorial Fund, Messrs. Platt Bros. and Co, Ltd., the celebrated textile machinery makers, presented a special and complete set of cotton spinning machi-

The Victoria Jubilee Technical Institute set up a new outlook before young men seeking an entrance in the textile industry. Upto 1890, the majority of the people who joined the mills did so only because they failed to get along in schools and despaired of obtaining a post in the clerical line. The textile line was not overcrowded and the salaries earned by the earlier members of the supervisory staff compared very favourably with those of their more intelligent brothers who chose the academic and professional careers. It is true that some youths from wealthy families—especially those connected with the managing agencies of mills—often paid the European officers to instruct them in the technical work but the sums paid were out of all proportion to the results obtained, and, moreover, this course was open only to the few. The formation of a technical institute now attracted a better class of recruits who entered the textile industry after obtaining a thorough grasp of the machinery and all the necessary calculations. What were

This article and "Developments in the Preliminary Processes of Weaving" by Mr. D. P. Joshi, B.A. (page 125), have been specially written for this *Souvenir*, through the courtesy of the Textile Association (India), and our best thanks are due to them —Ed.

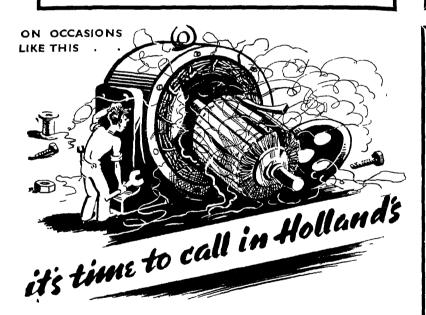
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hitherto regarded as "secrets" were now the property of everyone who cared to obtain the necessary training. Instruction no more depended upon personal idiosyncrasies.

The "Indian Textile Journal"

The second event which helped to throw open technical knowledge to anyone who cared to read, was the publication of *The Indian Textile Journal*. Although this *Journal* devoted a considerable portion to the commercial side of the mill-industry, it also published articles by practical men on different aspects of mill-work. The Founder and Editor of the Journal was Mr. S. M Rutnagur, who had practical training and experience of cotton mill management and kept himself in constant touch with the progress and working of the textile and allied industries. The *Journal* often voiced the opinions of millowners and championed the cause of Indian industry in general, but it has also been very outspoken in criticizing instances of irregularities and malpractices of several mill agents

Change in Outlook

The starting of the Victoria Jubilee Technical Institute and the inauguration of the Indian Textile Journal have been responsible for a complete change in the outlook of the technical staff. Hitherto the methods of Lancashire were followed without discretion. Lancashire mills are bigger units and the staff is highly specialized. Thus a carder in Lancashire is an experienced and expert carder but no more; he would usually know little of spinning and, possibly, less of doubling and reeling. Lancashire mills, moreover, usually concentrate on a very limited number of counts and the experience of a Lancashire man is usually restricted to those counts. Cases have occurred where well-known weaving masters from England had to solicit the help of Indian colleagues to initiate them into the mysteries of heavy size. Mills in India, barring a few exceptions, are smaller units and the range of work is consequently wider. A spinning master very often has to manage all sections from cotton mixing to yarn-baling. He may also be expected to be well versed in processing any counts from 4s to 40s. In some mills the range of counts is even wider. The methods of Lancashire were thus unsuitable to Indian conditions, but as the training prior to 1890 was received from Lancashire men, Lancashire methods were introduced in India without much change. The Technical Institute and the students who passed out from it, offered a better control of technical training, making it more suitable for our requirements. Technical students knew more about the industry as a whole and hence there was better co-ordination of the various sections which together constitute the mill.

Before discussing the further development of technical training, it would be interesting to note the distribution of the technical staff amongst the various communities. While the writer attaches no importance to these figures

as showing the superiority of any particular community, he feels that the figures are sufficiently interesting to be noted in passing A comparison of the position in 1895, 1925 and 1940 is therefore given in the table below with a classification of the technical staff according to the principal communities

Changes in the Composition of the Staff

Some distinct tendencies can be discerned from the table. Europeans formed about 43 per cent. of the mill staff in 1895, about 28 per cent. in 1925, and about 16 per cent. in 1940. Parsis constituted 46 per cent of the mill staff in 1895, 51 per cent. in 1925 and about 34 per cent. in 1940. Hindus represented only 8 per cent. of the mill staff in 1895, about 17 per cent. in 1925 and about 40 per cent in 1940. Mahomedans and the "others" occupy a comparatively minor position, although there is a remarkable rise in the number of "others" in the figures of 1940.

Many of the causes of the distinct fall in the number of European officers since 1895, have been already enumerated. Since the establishment of a technical Institute in Bombay, well-qualified technical officers became available and they were often more suitable to the special requirements of Indian mills. The case of the Parsis is in a different category. They have all along been leaders in the textile industry and, at one time, they controlled a considerable number of Bombay mills. During the last decade, an important group of mills was closed down and this has been responsible for the fall in the number of Parsis on the mill staff in Bombay. Many other mills have also changed hands and old and trusted servants have often lost their jobs through no fault of their own. The comparatively insignificant proportion of Hindus in the mill staff of the last century was due to the prejudices against manual work, entertained by the upper middle classes who often considered mill work degrading. These prejudices have been gradually overcome partly by the force of necessity and partly by a more healthy outlook on life. Facilities for technical training have also diverted to the textile line a part of the intelligentsia who were hitherto exclusively attracted to academic and professional careers The backwardness of the Mahomedans in point of education is responsible for the singularly low representation of this community on the mill staff of Bombay.

For the purposes of comparison, another table, classifying mill staff in all the cotton mills of India in 1940 is given on page 207.

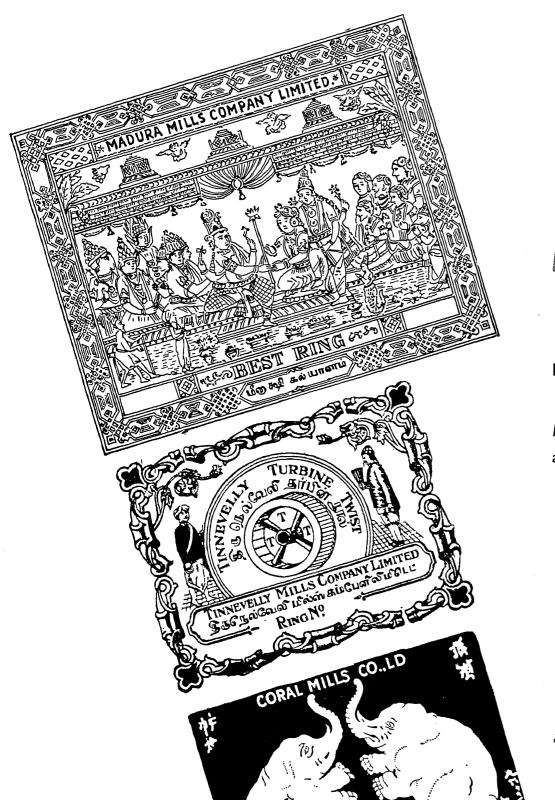
Panday Textile Trust

Apart from the services rendered by the Technical Institute and by the *Indian Textile Journal*, a desire was evident amongst the technical staff to organize amongst themselves and form an association where they could come together for technical lectures and discussions.

(Continued on p. 207)

Classified List of Mill Officers in Bombay Mills in 1895, 1925 and 1940

Europeans.		Parsis.			Hındus		Mahomedans.			Others.			Total.					
	1895	1925	1940	1895	1925	1940	1895	1925	1940	1895	1925	1940	1895	1925	1940	1895	1925	1940
Managers Carding Masters Spinning Masters Weaving Masters Engineers	27 20 21 13 23	28 27 24 27 7	20 10 13 17 8	20 24 24 12 32	32 43 39 31 56	25 30 28 26 33	4 6 6 1 4	11 15 17 10 14	27 31 38 22 48	2 1 0 1	5 0 1 0	1 2 1 2 0	2 0 0 0 1	8 0 0 2 1	3 9 7 8 6	55 51 51 27 61	84 85 81 70 78	76 82 87 75 95
Total	104	113	68	112	201	142	21	67	166	5	6	6	1 3	1 11	33	245	398	415



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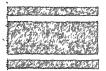
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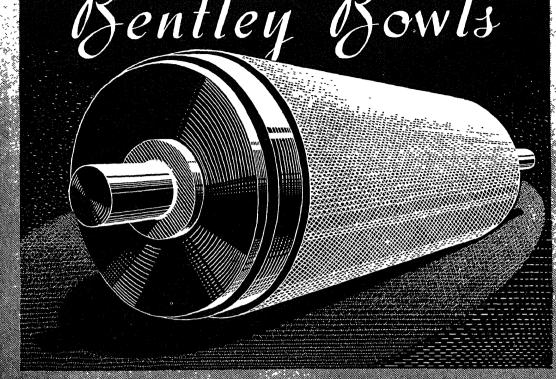
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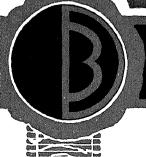
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The one man, of all others, who has been responsible for the satisfaction of this desire, is Mr Cowasjee Dorabjee Panday, who has ungrudgingly offered his services for the uplift of technical staff in cotton mills. He was primarily responsible for establishing the Bombay Textile and Engineering Association in 1900, and the credit for whatever results the Association has been able to achieve goes to Mr. Panday, who has been making up the annual deficits in addition to his contributions towards the subscriptions of various journals and periodicals required for the use of the members. Mr. Panday has always helped enthusiastic mill apprentices with gifts of books and periodicals. Recently he has established the "Panday Textile Trust" to encourage and create an interest among the literate cotton mill staff of all grades for reading modern literature on cotton textile technology.

Present Position of Mill Staff

Resuming this survey of Bombay mill staff during the last fifty years, an impartial observer will admit that the mill staff in general is to-day better equipped in technical knowledge than before. Apart from the facilities of technical education, market conditions require new varieties, new designs and fancy effects in the manufactured products; and, necessity being the mother of invention, much ingenuity has been in evidence in solving problems which never faced the mill staff of the late nineties. The complicated machinery is also studied more thoroughly and the veil of mystery which surrounded the box of tricks in a fly-frame no more baffles our technician. Size-mixings are not regarded as closed secrets, to be divulged only to a few selected persons with long experience. An inquisitive and enthusiastic mill officer can find instruction on all knotty problems which he is likely to meet.

Mill Officers and Workmen

The attitude of mill officers towards labour has also undergone a fundamental change. In the earlier days, recruitment and supervision of labour was the sole preserve of the jobbers and with a few notable exceptions, mill officers were only concerned with increasing their production and reducing costs. The jobbers had thus a free hand in dealing with the workmen and many unscrupulous persons exploited this situation to the full. Corruption, known to exist, was often connived at, and even straightforward officers who would not stain their own hands with dirty work, were often forced to ignore what was going on behind their backs. Jobbers and unscrupulous assistants sometimes did not hesitate to fill their own coffers, alleging the name of their unsuspecting superior. Things have now changed for the better. Officers of a better calibre and a more humane outlook are coming in increasing numbers and with the aid of the Millowners' Association and the Government Labour Officer, labour is able to secure a patient hearing for its grievances. The staff is in closer touch with the workmen than it ever was before.

Employers and Mill Officers

There is also a marked change in the relations between the mill staff and the employers. In the good old days, most mill agents were interested only in the financial position of their concern and left the internal management and the technical details to the mill officers in whom they placed implicit reliance. Cases were not rare when the owners sought the permission of their managers, on the rare occasions on which they visited their mills Millowners now take a more intelligent interest in technical details, and although sometimes this borders on undue interference, the officers are always kept on the alert to maintain good production and secure better efficiency. When unemployment was not so acute as it is to-day, service was secure and continued service for more than fifty years in one mill was not rare. Now with increasing unemployment and greater competition, millowners are always after their officers for better performance Comparative figures are always available and an officer of to-day has to keep his knowledge up-to-date if he seeks to satisfy his masters. Changes in mill staff are more frequent and the old days, when the working was considered satisfactory if there was no labour trouble, are gone for ever.

What of the Future?

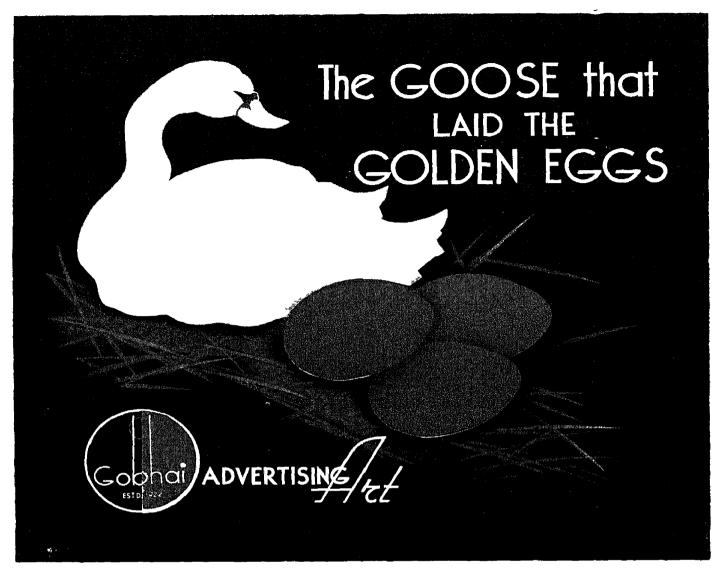
An indication of the lines on which the mill staff of the immediate future should organize will not be out of place at the conclusion of this brief survey of the cotton mill staff in Bombay during the last fifty years. In order that mill officers should be able to maintain their positions against increasing competition, it is necessary that they should be kept posted with the latest developments in textile technology. The achievements of the newlyestablished Textile Association (India), with its own quarterly journal, the Textile Digest, and regular monthly meetings for solving the problems of its members are well known, but the efforts must be on a more co-ordinated scale. The V. J Technical Institute trains its students but takes no active interest in them, once they pass out. It should therefore start post-graduate lectures and refresher courses in collaboration with the Textile Association to keep mill officers posted with the latest developments in textile technology. A central reading room and library could also be maintained on similar lines. Such collaboration would eliminate unnecessary duplication of activities and achieve maximum results with the minimum effort and expense. A fine example of such a collaboration has been offered by the cordial relations which the Indian Textile Journal has maintained with its young colleague, the Textile Digest.

On the occasion of the Golden Jubilee of the *Indian Textile Journal*, it will be the unanimous wish of all connected with the mill industry of Bombay that the mill staff will progress on right lines to the benefit of the industry and in fulfilment of the primary object with which this 50-year old journal was started.

Consolidated Table giving a classification of Mill Staff in 1940 in Mills all over India

				Europeans.	Parsıs.	Hındus.	Mahomedans.	Others.	Total
Managers Carding Masters Spinning Masters Weaving Masters Engineers	•••			82 71 87 76 70	60 40 42 40 72	247 195 205 195 224	9 7 8 9 11	39888	401 322 350 328 385
		_	Total	 386	254	1,066	44	36	1,786

SPECIALISTS IN TEXTILE ADVERTISEMENT DESIGNS



B R GOBHAI & CO.

HORNBY ROAD, FORT, BOMBAY

New Trade Marks Act—(Concluded from p. 43)

exclusively appropriated by any particular trader. The first impulse of anyone who wishes to popularize his goods in the market, but who has not given any serious thought to the legal aspects of the question, appears to be to refer to his goods by prefixing his surname and designating them as so-and-so's goods; or by a name which would emphasize their peculiar or superior qualities, such as "cellular" for shirting or "unshrinkable "for stockings; or by the geographical name of the place from which they originate, such as "Nilgiris" for coffee, "Darjeeling" for tea, "Aligarh" for locks, "Madras" for snuff; or by the name of a place which will be associated with goods of superior quality, such as "Paris" for toilet preparations The Act contains clear indications about the general unsuitablity of surnames, geographical words, descriptive or deceptive words and expressions, for registration as trade marks, and it is to be hoped that the legislative guidance given in this matter will enable the commercial community to choose their trade marks more prudently.

Assignment of Trade Marks

Another set of provisions contained in the Act is intended to facilitate the assignment of trade marks apart from the goodwill of the business to which they belong, or to permit the use of a trade mark by a person known as "registered user" who is associated with the proprietor of a trade mark. It is not possible in a short article like this to deal with these provisions in detail; but there can be no doubt that these provisions will remove a number of difficulties experienced by the commercial community at present in expanding their business without detriment to their trade mark rights.

The Act also provides for what is called "defensive registration." This would enable proprietors of well-known trade marks to obtain registration in connection with goods on which they have no intention of using the mark, if they can establish that the use of these marks on such goods by any other person would be calculated to cause members of the public to think that there may be a connection between such goods and the said proprietors. The scope of this provision is at present confined to "invented words."

The Act contains also special provisions for the registration of "certification trade marks," i.e., marks intended to serve as a warranty of some special quality or characteristic of the goods to which they are applied. The registration of such marks may be effected only by a person who does not carry on a trade in goods of the kind certified, and after the Central Government is satisfied with regard to the following matters:—

- (a) whether the applicant is competent to certify the goods in respect of which the mark is to be registered,
- (b) whether the draft of the regulations governing the use of the certification trade mark is satisfactory, and
- (c) whether in all the circumstances the registration applied for would be to the public advantage.

Textile Trade Marks

The Act contains special provisions relating to the registration of textile trade marks in British India. These special provisions provide that—

(1) A branch of the Trade Marks Registry will be established at Bombay for facilitating the registration of textile marks. Applications for the registration of textile

marks may, however, be made either at the Patent Office at Calcutta, or at the Bombay Branch, at the option of the applicant.

- (2) "In respect of all trade marks, applications for registration of which are duly made to the Deputy Registrar under this chapter, the Deputy Registrar shall exercise all the powers of the Registrar under this Act but shall be subject to the general superintendence of the Registrar." (Section 65(2))
- (3) "In respect of textile goods being piecegoods— $\,$
 - (a) no mark consisting of a line heading alone shall be registrable as a trade mark;
 - (b) a line heading shall not be deemed to be adapted to distinguish;
 - (c) the registration of a trade mark shall not give any exclusive right to the use of a line heading;
 - (d) the registration of letters or numerals, or any combination thereof, shall be subject to such conditions and restrictions as may be prescribed." (Section 64.)

A provision of the Act which is of immediate interest to trade mark owners is that contained in section 85, which authorizes the Central Government to prescribe such procedure as it may consider necessary for the deposit of trade marks at the Patent Office, in advance of the date when formal applications for their registration could be made after the main provisions of the Act come into force. By a notification issued under this section, it has been provided that persons claiming to be owners of trade marks used in British India and intending to apply for their registration may apply for the deposit of their marks only between 1st October 1940 and 31st March 1941. If the trade mark to be deposited is for textile goods, the application may be made, at the option of the depositor, either to the Patent Office, Calcutta, or the Branch of the Trade Marks Registry, established at Bombay. In a Press Note issued by the Commerce Department, Government of India, the purpose of this deposit procedure is explained as follows:—

"The deposit will help the owner in obtaining further registration later and will enable the Registrar, among other things, to notify the original owner in case of any conflicting marks, thus giving him the right to be heard first."

After the trade marks have been deposited a list of such marks will be prepared according to the different classes of goods. For this purpose it is proposed to adopt tentatively the classification of goods recommended by the International Convention for the Protection of Industrial Property, held in London in 1934. Copies of the list of Deposited Trade Marks will be open to inspection by the public both at the Registry at Calcutta and its Branch at Bombay.

From what is stated above, it would be apparent that although the enactment of legislation for registration of trade marks in this country was considerably delayed, care has been taken to embody therein provisions which are intended not only for enabling a mere "registration" of trade marks, but also for meeting the requirements of modern conditions of trade and the peculiar conditions prevailing in this country. The ready response made by the public to avail themselves of such of the provisions of the Act as have already come into force, is a very happy augury of the usefulness of the new legislation.

The Savatram Ramprasad Mills Co. Ltd.

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Agents:

SETH SAVATRAM RAMPRASAD

(One of the oldest and reputed business houses of Berar)



40% Dividends.

SETH ONKARDAS RAMPRASAD the founder of the Mills in 1912

Statistical Survey of Work and Progress

The mills are situated in the heart of the City of Akola—a prominent cotton trade centre, in the proximity of the cloth and cotton markets

Total number of Sp	pındles at worl	k	-	-		13,096	
Total number of L	ooms at work		-	-		292	
Average number of	f Workers per	day	-	-		1,000	
Average quantity of	of Cotton cons	umed	per yea	r -		9,730	b/s.
Average quantity of	of Yarn produc	ced pe	er year	-		1,984,000	lbs
Average quantity of	of Cloth produ	iced p	er year	-		1,810,500	lbs
Average quantity of	of Coal consum	ned po	er year	_		3,300	tons
The Share Capital	-	-	-	-	Rs	7,55,000	
The Reserve Fund	~	-	-	-	Rs	9,24,000	
Total Value of the	Block -	-	-	_	Rs.	23,24,624	
Gross Trading Pro	fit (1938-39)	-	_	-	Rs	2,53,268	
Dividends	(1937-38)	-	-	-	Rs	18	%
	(1938-39)	-	-	~	Rs	18	, -
Depreciation	_	-	-	_	Rs.	10,91,331	, •



SETH KISANLAL ONKARDAS
the present Managing Director
under whose scientific and enthusiastic management the mill has
flourished to such an extent

We specialise in the manufacture of coarse cloth and yarn Particulars sent on request

Managing Agency System—(Concluded from p 45)

are fairly high care is taken to ensure that only competent men are retained. The careers offered by British managing agency firms to university men selected with the assistance of the University Appointments Board allowed a high proportion of the entrants to obtain between the ages of 35 and 40 emoluments equivalent to £2,000 to £3,000 a year. But if their work is not up to the standard, they are sent back at the end of the first period of five years. Indian managing agency firms are still to develop either individually or collectively a system of recruitment for their higher grade supervisory staff. A system of competitive examination combined with selection after interview is urgently required if industry is to have really first-rate superior staff.

The advantages of central office control have not also accrued to mills managed by Indian managing agency firms In the case of jute mills tea garders coal companies etc managed by British agency firms multiple management of industrial enterprises has secured a substantial measure of administrative integration It has ensured a co-ordination of the activities of all the units under common management, it has secured economies in respect of sales and purchase of supervision and of day-to-day administration, and it has also secured a certain measure of financial co-ordination But so far as cotton mills were concerned the benefits of common management were neutralized by the system of obtaining commission for the agents themselves on purchases and sales, which was not passed on to the mill companies The managing agents were themselves brokers traders and agents of machinery stores and raw materials and were interested in selling to the companies at high prices and thereby enriching themselves Even in the case of those who did not resort to such devices, the fact that they were not bound to explain their transactions to a Board of Directors or to the shareholders and the fact that there was no independent scrutiny or check as regards the price and quality of the goods supplied by the managing agents themselves necessarily led to waste and negligence

What of the Future?

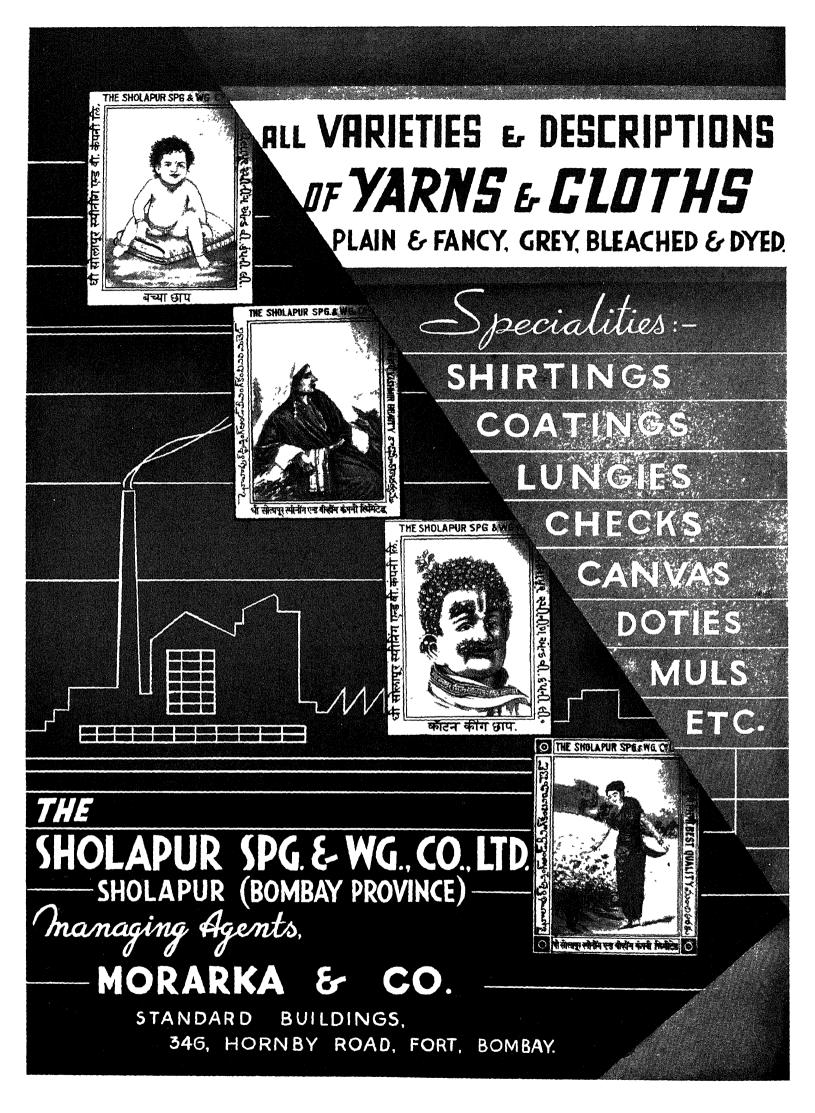
What of the future? Can the Indian managing agency system survive in the face of all the defects and shortcomings which it has exhibited during the last 80 years of its history? And again should it survive in the sense that it still has a useful and indispensable role to play in the economic development of the country?

The new Companies Act of 1935 has undoubtedly given a fresh lease of life to the managing agency system Far from doing anything to weaken it it has gone a long way to strengthen it by removing all the ugly features which had defaced it and the abuses that had crept into its working. It has first of all converted the managing agents from their position of industrial dictators into more responsible persons. They are now answerable for their subsidiary activities which were so long uncontrolled to the Board of Directors who from 1935 were to be not the dummies they had been intended to be by the managing agents but were persons elected by the shareholders at a meeting. The managing agents can no longer contract with the company for the sale purchase or supply of stores and materials without the consent of three-fourths of the directors present and entitled to vote Further managing agents cannot any longer utilize for themselves the funds belonging to the companies under their management nor can they invest the funds of one company in the business of another company which they manage

Of even greater significance is the fact that they will no longer be the permanent and irremovable business executives they had been up till now No manag ing agents can continue to be so for more than 20 years, unless they are elected once again by the shareholders Again managing agents cannot sell or transfer their rights of managing a company to others without the approval of the shareholders Managing agents cannot hereafter also engage on their own account in any business which is of the same nature as, and directly competes with the business carried on by the company under their management Finally the remuneration payable to the managing agents has been limited to a percentage of the net profits of the company after a whole lot of deductions for depreciation repairs bounties or subsidies received from Government etc In all these ways the system has been purged of its abuses and the way opened to the upright and competent managing agents to prove their worth by taking full advantage of the elimination of the bad type of agents who had brought such discredit to the system

Thus to the question Can the managing agency system survive? the answer is that it depends entirely on the managing agents themselves. In the future they will be judged by their work and service to industry and no industrial unit will care to entrust the task of management to one who does not merit the choice. The less efficient and honest type of managing agents will receive short shrift. If the others who survive instead of taking advantage of loopholes in law render useful and essential service to industry they can certainly retrieve the system. But the system will no longer be the universal or all-pervading thing that it has been so far. It can only thrive under the limited conditions imposed by law and by the financial and other needs of industry.

The reformed managing agency system can still justify itself in two ways. In the case of all new industries in which much pioneering and investigating work is involved the services of an experienced firm of managing agents will certainly be valuable Again until the existing gaps in the structure of the Indian capital market are filled by the organization of financial institutions to serve the long-term needs of industry some of the more prominent and financially strong managing agents may be able to meet the deficiency Neither of the above services can be rendered by any except a few agents of established reputation and probity. The ordinary type of managing agents is an anachronism in the changed conditions of Indian industry Most of them are unable to render even the financial aid which was supposed to constitute the justification for their continuance Their methods of financing have also been discredited The short and medium-time deposits from the public which were utilized for permanent capital expenditure and the floating of debentures by the managing agents have been found to be undesirable Further in old and well-established industries there is no need for the work of the managing agents as such As each new industry gets started and experience is gained by the Board of Directors the managing agency system will become superfluous and will have to give place to the ordinary type of Board management In other words the managing agency system should be confined to new types of businesses and even there, its continuance after the first period of 20 years should depend mainly upon the financial and administrative capabilities of the particular agency firms There is no room hereafter for the predatory type of managing agents



Chemical Research in Textile Industry—(Continued from p. 81) naphthols, but owing their coupling power to their being 1:3-diketones Of the numerous bases used commonly for diazotisation and coupling with the naphthols, perhaps the most interesting is Variamine Blue; the comparative stability of the diazo salt to heat and to reducing agents and its low coupling energy enable naphthol reserves under naphthol grounds to be produced Material advance in naphthol dyeing has been effected by the preparation and marketing of stabilized diazo salts In printing the naphthols are of the utmost importance on account of their versatility in regard to various styles. Admixtures of the stabilized diazo salts with the naphthols (Rapid Fasts, Rapidogens, Rapidazols) have been rendered available in printing, so that both the components may be applied to the fabric in a single operation Similar mixtures suitable for dyeing purposes and azoic dyes prepared in substance temporarily solubilized or dispersed for use in printing are two lines of advance, of which the latter has already partially

Progress in printing has naturally run parallel with developments in dyes and dyeing. The chemical reactions involved are more complicated in printing than in dyeing on account of the circumscribed nature of the processes and the varied effects that may be desired. Apart from the wide range of dyes with the necessary brilliance and fastness which the printer can now utilize, his work has been greatly facilitated by improved thickeners, mordants, developers, catalysts, and auxiliary agents.

Yet another example of the success of the colour chemist in simplifying the work of the dyer is the group of Neolan and Palatine Fast colours, which are water-soluble mordant azo dyes containing co-ordinated metal, and are therefore applicable to wool and silk by a single-bath process

In the early days of the manufacture of acetate silk there was a lack of suitable dyes for the new fibre, but now a disproportionately vast range of dyes for acetate silk is available, mostly based on the fact that cellulose acetate behaves like an organic solvent, and nearly any dye which is soluble in a solvent such as ethyl acetate will be taken up by the fibre if it is offered as a colloidal dispersion in water.

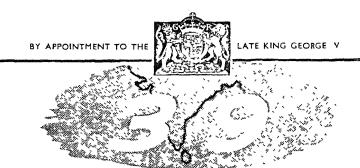
Wetting Agents

A new and ever-increasing field in the processing of textiles has been opened up by recent research into the chemistry of wetting agents. Of such wide utility have these proved to be that they are now considered to be essential assistants in nearly every stage of the conversion of grey yarn or cloth to finished fabric, but as indicated later, individual claims must be carefully scrutinized. The substances are polar compounds of more or less complex character, belonging to the aliphatic, aromatic, hydroaromatic and heterocyclic series, and possessing one or more of the properties of wetting, emulsification, detergency, dispersion of calcium soaps, promotion of level dyeing, softening of textiles, and the ability to impart a special feel or handle to fabrics. The activity of the normal type of wetting agents lies in the anion, but kation-active auxiliaries have recently become important for special purposes, such as the improvement of the fastness to washing of dyeings with substantive colours, stripping azoic and vat dyeings, and production of permanent finishes by taking advantage, as explained earlier, of the reactivity of the hydroxyls of the cellulose molecule. Even prior to the advent of the quaternary ammonium salts and other compounds

capable of chemical combination with cellulose, the chemical aspects of finishing were tending to assume greater significance than the mechanical processes of starching, mangling, stentering and calendering. Some examples of such chemical finishing are the partial or surface solution of cellulose by suitable solvents (which may be described as superficial rayonization), resulting permanently in a fabric with the lustre of artificial silk, but with the tensile strength of cotton; transparent, linen-like and wool-like finishes with sulphuric acid; the use of solutions of cellulose or nitrocellulose or cellulose acetate or alkyl ethers of cellulose in finishing mixtures; proofing against damage and deterioration of various kinds (water, mildew, moths, heat, fire); immunization and animalization; and "anticreasing" by the incorporation of synthetic resins.

Future of the Indian Textile Industry

The Indian textile industry has so far been content to derive at second hand the benefits of this many-sided progress, but to imagine that it has done so at no cost to itself would be a tragic mistake. There can be little doubt that unduly heavy payment is being made for our failure to make advances in textile chemical research on our own account. The dependence of our textile mills for technical knowledge and assistance on the great colour firms, whose interests and ours are not necessarily identical, would appear to be the most disquieting feature of our premier industry. To quote but one example, very considerable amounts of proprietary products (wetting agents, detergents, gums, modified starches, finishing emulsions, etc.) are being used: their use constitutes a significant percentage of the total processing cost and might be a serious drain on the resources of an industry which has to face severe competition and to work to a narrow margin of profit. The ultimate standard by which every industrial process can be judged is the cost, consistent with a desired result; if, therefore, the use of a proprietary product is essential for the satisfactory carrying out of the processes of bleaching, dyeing, finishing, etc., and an equally good result would not be obtainable by restricting oneself to the common chemicals, the expenditure would be justified. Nevertheless, the disinterested chemist who may have an opportunity of studying the processes in vogue not infrequently notices that there is a marked tendency for the processer to resort to the use of many of these "auxiliaries" of undetermined composition, with little justification for the added cost. A variety of desirable properties is usually claimed for each of these and the unwary processer, who may not possess the basic scientific training or the time or the laboratory facilities for a close examination of the claims, is apt to regard them as panaceas for the many ills afflicting his textile materials and processes. To diagnose the real cause of a fault or a difficulty and to seek a specific solution are more tiresome than to add a "general auxiliary" and to hope for the best. In those cases where the use of an expensive proprietary product may be really called for, it is a common observation that it is not employed under the optimum conditions A wetting agent, for example, may be employed at a concentration well below that at which it has any action, or a product unstable to alkali may be added to the kier boiling lye. Careful assay of the product and a knowledge of the precise conditions under which it is employed with advantage in a processing operation are essential desiderata. Problems such as these may be multiplied, but in conjunction with the achievements of the (Continued on p. 215)



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Problems of Indian Mill Industry—(Concluded from p. 27)

Our lessening dependence upon coal as motive power through the starting of hydro-electric works in many parts of the country solves to a great extent the question of future expansion of the industry in areas where coal is not available except by payment of heavy railway freight Punjab, Bombay and Madras Provinces have already initiated huge projects for supply of electric power.

The millowners of the future will have to devote considerable attention to factory construction. Mills of modern type are already provided with spacious, well-lighted and well-ventilated buildings which have added greatly to the comforts of operatives. Owing to the progress of science, air-conditioned factories are no longer a mere proposition on paper. It may, however, be worth while considering the question of underground erection of factory buildings, wherever soil conditions permit, in order to escape the ravages of aerial attacks which are a prominent feature in modern wars.

War and Export Prospects

The present war is creating a scarcity of textiles all over the world, owing to the preoccupation of many factories on military supplies and owing to shipping difficulties which make transport to the consuming markets extremely prohibitive in cost and which restricts also the quantities required by these markets. India now has a very favourable opportunity of developing the future of her textile industry on the export side also. Empire and non-Empire countries like Australia, South Africa, Malaya, Dutch East Indies, etc., which lie within our economic orbit, take no less than Rs. 400 million to Rs 500 million worth of piecegoods every year. The visit of the various Supply Delegations to this country is providing the necessary contact, and if we go about this business systematically, we shall have captured huge external markets for the products of our textile industry. So far, our piecegoods exports overseas are negligible at the figure of about 80 million yards or 2 per cent of our production.

Whether in the post-war world cotton goods alone will hold the field or whether cloths produced through new scientific processes will to some extent oust cotton manufactures remains to be seen. Anyhow, a substantial beginning has been made, specially in the United States. Already fabrics are being produced from Nylon which has a fibre stronger and more elastic than silk, wool, linen, cotton or rayon and is used considerably for hosiery in addition to sewing thread, lace, women's underwear, upholstery, linings for men's suits, etc. An American journal already pictures a housewife of 1964 wearing stockings made from coal and dress of spun glass and hats trimmed with glass cloth and carrying handbags made of the same material. Vinyon is another product made from petroleum which is being used for textiles.

Is this "Planned Economy"?

One sinister development affecting business and industries in the future is the fusion of Communist and Fascist ideologies masquerading under the name of "Planned Economy." In India schemes galore have been set afoot, ranging from unabashed confiscation of proprietary rights in industries to various degrees of governmental or national intervention in the affairs of business. In short, this is nothing but an onslaught upon the system of free enterprise with which totalitarian economics can never blend. Although not expressly stated, it is inherent in all schemes of "Planned Economy" that the employer is severely regimented while labour

becomes to a large extent the chartered libertine. Excessive charges of production would be inevitable, individual initiative would be lost, industries must crumble and employment must suffer.

The blight of governmental interference has already had a withering effect on industries. We have had committees galore whose pro-labour fiats have considerably exhausted our resources at a time when we were recuperating from a long period of intense depression. We have had upon these committees visionaries and enthusiasts who are busy framing a Western charter for labour within an Eastern framework of inefficiency and slackness. A comparatively well-paid labour force of barely half a million is to benefit at the expense of the poor hundreds of millions from whose pockets wages in the textile industry must necessarily come. In some Provinces, pressure has been used for the recognition of Communist unions—whose members openly preach class war.

Some of the provisions of the Factory Act tell upon the efficiency of our work. Fines for bad work are being restricted to a nominal figure with the result that carelessness of the operatives is on the increase and there is no check on the production of faulty materials which are not acceptable to the buyers and have to be sold at considerable loss.

An increasing mass of statistical information is often unnecessarily and peremptorily called for, causing interference with our daily routine, entailing hardship on our clerical staff and involving us in considerable expenditure.

In one Province the official sword is kept dangling on the employers by a statutory recognition of the Collection of Statistics Bill under which the Director of Industries or his authorized agent can at his discretion have access to the factory premises and even the private residence of the employers. Should the employers refuse such access, which they are likely to do in the case of documents relevant to business secrecy, the penalty for every such offence has been fixed upto the maximum of Rs. 500.

Coping with the present war efforts and with future expansion thus becomes difficult when the textile industry is in the grip of an interfering bureaucracy in different Provinces. What is wanted is uniformity of legislation on an all-India basis and on sound business lines.

I have taken a panoramic view of the conditions affecting the industry both favourably and otherwise. While many a tough problem will have to be tackled in the future, I am optimistic enough to believe that the Diamond Jubilee Number of the *Indian Textile Journal* will record a decade of outstanding progress of a great national industry.

Chemical Research in the Textile Industry

(Concluded from p. 213)

textile chemist outlined in this necessarily sketchy survey, they are sufficient to show the urgent need for the organization, on a large scale and on a permanent footing, of research on the indigenous manufacture of the materials used in the industry, the possibility of effecting economies in the operations of bleaching, dyeing, printing and finishing, and on the development of new methods and novel effects in the chemical processing of textiles.



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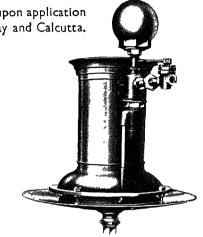


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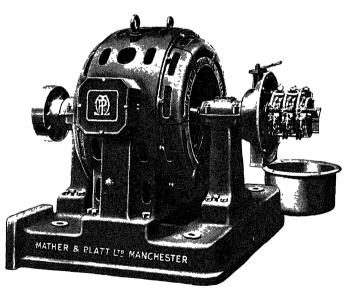
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ENGLAND London, SW. Improvement of Cotton Varieties—(Concluded from p 31)

carry the hereditary characters Recently, however, the employment of a drug called colchicine has made it possible to get fertile seeds from crosses of American and Indian cottons Research on this matter is being carried on mainly at Surat and is being financed by the Indian Central Cotton Committee

Improved Cultivation Methods

Improvement in the actual cultivation methods used in cotton-growing has always been one of the tasks of Agricultural Departments Cotton varieties, cultivation methods, soil and climatic conditions vary throughout India and hence the improvements have had to be adapted to the local conditions Most Agricultural Departments are now in a position to give expert advice on such questions as seed-rate, seed treatment, greenmanuring, rotational crops, and inter-tillage. In irrigated areas advice is given on the nature and rumber of waterings, and some excellent work has been done on this subject, both in the Punjab and Sind. In the Punjab an investigation is now going on (financed by the Indian Central Cotton Committee) to discover the causes of the much dreaded cotton "failure" which occurs in certain years when bolls open badly and the seeds are empty, with little useful cotton on them. This appears to be largely, though not entirely, determined by soil conditions, and it may be that some system of manuring or soil treatment will be a protection if not a remedy The growing of other crops, such as pulses, between the cotton rows and alteration in sowing date seem to reduce considerably the attack of cotton root-rot in the Punjab and these discoveries may lead to useful modifications in cultivation practices.

Cotton insect pests have received much attention from scientific research workers. In the case of the spotted bollworm, it is now proved that the early uprooting of the cotton plant after harvest, so as to leave the ground completely free of cotton for a few weeks, greatly reduces the attack. Measures to popularize this useful practice have been taken in Bombay and the Punjab. In Hyderabad State the spotted bollworm also hides in the soil and so a different technique has had to be devised there. As regards the pink bollworm, it is proved that heat treatment of the seed reduces its attack. Jassids are the most troublesome insect pests at present. These are insects which suck the juice out of the green parts of the plant and reduce its strength. The most promising line of defence seems to be the breeding of Jassid-resisting strains and this is being attempted.

The Indian Central Cotton Committee is continuously watchful of all requirements of Indian cotton cultivation throughout the whole of India and at various times has made a comprehensive survey of the whole position. A very important meeting was held in 1939 when a special sub-committee dealt with the present position and future prospects of Indian cotton. The emphasis laid by this committee on the improvement of the efficiency of cotton cultivation has resulted in the financing of certain so-called "projects" in which a whole series of improvements is being "put across" as a system of agriculture affecting not only cotton but also all the crops grown along with it or in rotation with it, in compact groups of holdings or preferably in complete villages A typical project of this type to be carried out in the Central Provinces involves the following

improvements -

- (1) Land development (drainage, embankments,
- (2) Building up soil fertility (composting, etc).
- (3) Rotation of crops with groundnut and jowar
- (4) Use of improved seed (Verum 434 cotton, Groundnut A K 12-24, Bansipalle wheat)
- (5) Improved methods of cultivation.
- (6) Introduction of diversified farming (i.e., inclusion of animal husbandry)
- (7) Introduction of subsidiary industries.
- (8) Organization of cultivators on co-operative lines A word or two must be said about cotton seed distribution schemes. It is no use breeding a good variety of cotton if the cultivator cannot get the seed in large quantities, hence these schemes have been devised and put in action in various Provinces and
- States. Any seed scheme has the following essential stages .--
 - (1) The plant breeder's plot where he produces a small amount of absolutely pure seed
 - (2) The Government farm where this seed is multiplied in a pure state.
 - (3) The Registered Growers—responsible cultivators who agree to grow only this variety and allow the Agricultural Department to "rogue" it (i.e., purify it by uprooting all plants not true to type).

Thereafter the seed goes to reliable agents who get some commission on the sale of these seeds. The Agricultural Department often undertakes the collection of indents and orders for such agents. A system like this needs a lot of attention on both the technical and the financial sides. Where well managed, such schemes have caused a rapid extension of valuable new varieties and a consequent increase in income to

In current speech we often hear of a subject being attacked on a "wide front." That certainly is the case with cotton improvement in India. The attack has not diminished since it received its stimulus with the establishment of the Indian Central Cotton Committee, but continues in many directions, carefully watched and scientifically guided. We may expect news of further improvements in yield, in staple length, in ginning percentage, in disease-resistance and in farming practices.

A Premier Millowners' Organization—(Concluded from p. 147)

been appreciated by those tribunals as also by Provincial and Central Governments

The work done by the Association on behalf of the textile industry in general and the Bombay industry in particular has been very widely recognized and the Association has to-day the privilege of being represented on the following institutions:

Central Legislative Assembly; Bombay Legislative Assembly; Bombay Port Trust; Bombay Municipal Corporation; Indian Central Cotton Committee; Victoria Jubilee Technical Institute; Local Advisory Committees of the G. I. P. and B. B. & C. I. Raılways; Royal Institute of Science; University of Bombay; Sydenham College of Commerce; Bombay Smoke Nuisances Commission: Empire Cotton Growing Corporation, etc.

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Review of the Cotton Trade—(Continued from p. 57)

brought in nationalist economics in place of free trade. The total imports of cotton textile goods including raw cotton into India during this decade were, in crores of Rs 46.4, 53.2, 64 6, 68.3, 50.4, 44.8, 54.9, 63.6 and 61.3. The last two figures practically belong to post-war time. We may continue the figures for a further ten years, the years of boom, when people did not realize that they were living in a period that was bound to be followed by a terrible depression Figures for the decade 1920-30 are as follows (value of total imports in crores of rupees of cotton textiles including raw cotton). 107.1, 61.5, 72.9, 71.4, 88 1, 71 0, 71.8, 73 5, 67.5, and 63.0. These are very big figures and denote a large increase in the imports. Things were to change the very next year. But the decade under notice shows a big advance in our imports, and along with England, Japan had taken an important place as an exporter to India. We shall now look to the export figures From 1911 to 1920, the total exports (of which raw cotton formed a very important part) were valued as follows, in crores of rupees: 47.2, 39 5, 40.7, 53.3, 41.6, 34.6, 49.9, 56.1, 45.2 and 86.4. The figures, similarly prepared for the next ten years (1921-30), are very impressive They are (in crores of rupees) 60 1, 70.4, 84 5, 109.9, 103.0, 105.1, 69 9, 56 9, 74 3, and 72 6. Of these the exports of raw cotton were valued at 41.7, 54.4, 71.1, 98 7, 91.5, 95.2, 59.0, 48.0, 66.7 and 65.6. This means that the enlarged size of our export figures was mainly due to the exports of raw cotton. It is interesting to remember that our main customer for raw cotton during these apparently prosperous years has been Japan. The value of exported manufactures during these ten years is given (in crores of rupees) by the following figures . 8.1, 8.0, 7 6, 7.2, 7 6, 6 7, 7 7, 6.8, 5.6 and 5 1. The figures tell their own story. India found some new markets but she has really never captured foreign markets in the sense in which England, Japan or Germany had captured them for a considerable time. As in imports, so in exports, the decline definitely started in the year 1931, and the boom, such as it was as far as India was concerned, was definitely over. It must be stated here clearly that India could have much benefited during the post-war years, and foundations of a sound industrial plan could have been laid during the period. Government, as well as the so-called captains of industry were thoroughly apathetic, and the grand opportunity was lost. There was no man in India at the time with the vision of the late Jamsetji Tata, who combined high patriotism with a keen sense of business. The story of the remaining years, down to our own time, makes depressing reading. In fact, it is the story of a depression. The world was blundering on in economic affairs and India had her full share of it. It was during the period 1921-30, that an Indian Tariff Board was appointed and Indian industry was placed on the basis of what has been called discriminating protection. Huge sums have been spent in aiding certain industries, but, unfortunately, industrial progress has not been commensurate. The figures for imports (valued in crores of rupees) from 1931 are as follows: 31.7, 36.1, 33.9, 21.2, 26.9, 27.6, 23.1, 27.4, 22.1 and 22.1 (for 1939-40). Similar figures for exports are as follows: - 51.8, 28.5, 24.0, 30.6, 38 0, 37.2, 48 9, 38.8, and 31.8 (for 1938-39). The exact figure for 1939-40 is not yet available, but it appears that during that year there was very little export of manufactured goods. The value of the exported raw cotton was a little over 30 crores. The figures for the export of raw cotton during these ten years were (in crores of Rs.): 46.8, 23.8, 20.7, 28.0, 35.4, 34.5,

45.2, 29.8, 23.9 and 30.1 (for 1939-40). This again means that the main factor of the exports was raw cotton, and that as soon as Japan commenced taking less cotton from us, our exports went down and farther down.

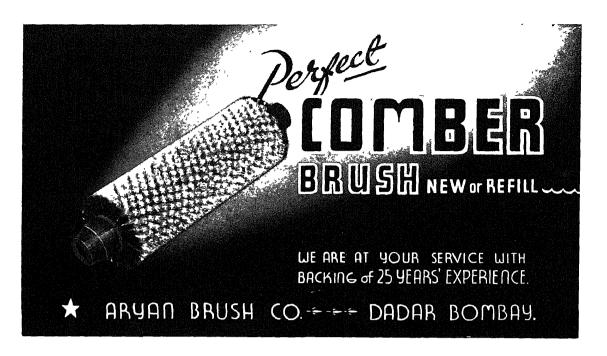
Progress of Manufactures

In order to complete our picture, we must get some idea as to the production of manufactures in India. We need not go, for that purpose, over the whole range that we tried to explore with regard to the foreign trade of the country. We might take the last thirty years or so for our observation. The figures of total yarn produced in India (in thousand lbs.) from 1909-10 are as follows:—593,424,576,996,590,842,650,365,644,853,614,957,683,155,644,447,626,801,580,361. The last figure is for 1918-19, the first post-war year Similar figures for the production of piecegoods for the ten years were as follows:—215,461,230,861,252,126,267,663,256,406,258,180,330,853,354,808,359,178,325,780. Similar figures for further years are given below in tabular form

	Year		Yarn	Manufactures
1919-20 1920-21 1921-22 1922-23 1923-24 1924-25 1925-26 1926-27 1927-28 1928-29 1930-31 1931-32 1932-33 1933-34 1934-35 1935-36			597,355 621,655 653,011 661,936 570,125 661,162 623,371 734,224 724,588 557,675 730,819 753,665 848,126 885,772 796,711 853,241 900,568 887,103 975,615	355,681 339,334 374,219 372,280 365,008 413,768 416,783 487,198 509,293 376,513 484,621 507,870 585,296 597,952 551,398 621,619 637,142 650,253 715,486

The figures for 1938-39 are not yet fully available. The Review of the Trade of India for that year, however, remarks (page 27). "The production of cotton piecegoods attained a record figure in the year under review, amounting to 4,269 million yards as compared with 4,084 million yards in the preceding year. This is about a $4\frac{1}{2}$ per cent. increase."

When we carefully look at these figures we come to the conclusion that during the last twenty years, the Indian production of yarn has gone up by 50 per cent. while the production of piecegoods more than doubled. We have to remember that before the quota system was adopted for Japan and certain foreign countries, the imports of piecegoods from Japan into this country were heavy. The consumption of goods produced in India has certainly gone up in the country, but cheap imported goods also has been consumed in large quantities, as is clear from a study of the import figures. Much water has flowed under the bridges since the end of the last world-war, and an important factor as far as the growth of the Indian cotton industry is concerned is labour and its discontent with regard to wages and other conditions of employment. But for the strikes that took place during the last 20 years, the production of Indian cotton mills would have been much larger. It is not, however, intended to convey that the responsibility of strikes is all on one particular side. The fact is there, however, that what are called industrial disputes have contributed to considerable waste in the industry and loss to workers themselves, the latter resulting in the reduced purchasing power of employees



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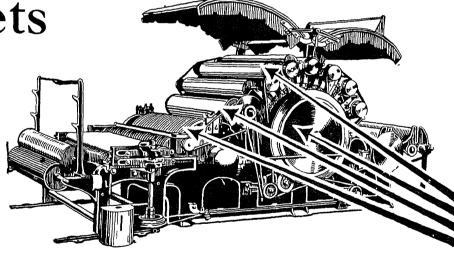
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of mills. Economic processes are so interwoven with one another that one process has immediate reactions on the others. It has been already stated that the adoption of what was called discriminating protection has made material and far-reaching alterations in the structure of Indian industry as well as in the matter of India's foreign trade. Discriminating protection in India was further affected by what is called inter-imperial protection and one clear result of these restrictive policies has been the conversion of Japan from a willing customer of Indian raw cotton into an antagonistic competitor with Indian piecegoods in Indian markets. The prices of raw cotton in India never were free of the influences of the American market, but the fact is there, that declining prices were enormously helped by the loss of India's biggest customer for raw cotton

The Last Twenty Years

There has been great industrial activity during the last twenty years, but there is a great difference between the swadeshi movement early in the century and the industrial movement that has taken its place. The swadeshi movement that followed the Partition of Bengal was characterised by an idealism that is lacking in the present attempts to build up an industrial India. Those who desired to manufacture various articles ın India from 1904 to 1912 were prepared to sacrifice everything they possessed to start some swadeshi concern During the last 20 years the industrial movement has passed into the hands of professional company promoters who look to profit first and other interests afterwards. That explains the rise and progress of the school of protection and its efforts have succeeded in putting money into a few pockets at the expense of the taxpayer and the consumer. The progress of protection has been a dominant factor in the history of Indian industry and the foreign trade of India. Trade pacts are the direct results of the policy of protection. Another feature of the last twenty years has been a feature that has characterised trade all over the world since the last war, particularly the post-boom years, prices that refuse to rise. In fact, the old capitalist economy has received many a rude shock during the last two decades, and even the present war is partly due to the wrong economics that held sway during and after the last world war. India profited little after the last war, and the cotton textile industry did not fare very well when it had to confront adverse times in post-boom years. If all was well with the industry, our foreign trade figures would have revealed a different story altogether. It is true that India has started producing finer counts, and they do replace certain imports from Manchester. For that purpose, however, we are importing more and more raw cotton, particularly from Egypt, which shows that really adequate attempts have not been made in this country, either by Government or by the trade, to improve the quality of indigenous cotton.

This brief review may be closed by stating frankly that the figures of the foreign trade of India, as far as the cotton textile industry is concerned, do not indicate that the industry is based on sound lines. And now, due to circumstances connected with the present war, the finding of new markets has become absolutely necessary. Above all, the Indian market is still open to foreign manufactures, and they should be replaced by Indian manufactures as soon as possible.

The Handloom in India—(Concluded from p. 59)

textile producers in India In fact, the present state of relationship between the two has gone much too far to be still called merely competition

Change in Government Policy Called For

The recent tariff measures adopted by the Central Government have, on the one hand, fostered the development of the cotton mill industry, and, on the other, adversely affected the interests of the handloom weavers. The Excise Duty on cloth which was levied for the first time in 1896 offered some protection to the handloom weavers against mill competition. But this was abolished in 1926, as it was very much resented by the cotton mills.

In 1927, the import duty of 5 per cent. was converted into a protective duty of $l\frac{1}{2}$ annas per lb. or 5 per cent. ad valorem, whichever was higher. At the present market rates this specific duty covers about 25 to 30 per cent. of the cost of the coarse yarn, which the hand weavers use extensively. The duty was further increased for a short period from 1931 to 1934 to $l\frac{7}{8}$ annas per lb. or $6\frac{1}{2}$ per cent ad valorem. Although it has now been reduced to $l\frac{1}{4}$ annas per lb. or 5 per cent. ad valorem, it enables the local mills to raise appreciably the prices of yarn sold to handloom weavers

It was largely as a result of this tariff policy of the Government of India that the cotton mills could increase their output of cloth by more than ten times in the course of the last forty years to a corresponding increase of only 50 per cent. in hand-woven cloth The effect on hand weaving of these tariffs, imposed exclusively for the benefit of the textile mill industry, calls for an early redress, for, without a change in the present policy of the Government no substantial relief can come to the hand weavers

The handloom weavers, while feeling acutely the various handicaps under which they have to carry on a very unremunerative occupation, are not insensible to the interest of the cotton mills, on which they depend for their raw material. While wishing, in their own interest, for the prosperity of the mills, they cannot afford to make such a sacrifice as they have been making for the last 14 years. It should be recognized that hand weaving, though based on manual operations, possesses certain elements of strength masmuch as it meets more than one-fourth of the total requirements of the country in cotton cloth. It is for this reason that it has survived machine competition, both internal and external, of over a century. As such, it deserves every encouragement for its existence, if not expansion. In order that the interests of these two industries might not come into conflict, it is essential that close co-operation should be brought about between them and only then can they be expected to move side by side in a spirit of cordial relationship.

It is gratifying to learn that this subject of vital economic importance is now engaging the attention of the Central Government. Various suggestions are being made to redress the harm done to the poor handloom weavers. It is hoped that the representatives of the cotton mill industry, together with the Directors of Industries representing the handloom weavers of the different Provinces and States, will hit upon a suitable solution of the problem, which will be in the interests of the country and will be speedily implemented by the Government of India.



Indicators of Business Activity—(Continued from p. 41)

number worked out on the basis of these prices. The Government of India have under consideration a proposal to construct an index number of wholesale prices for India and in this connection, they had consulted both the Millowners' Associations in Bombay and Ahmedabad, and also the trading interests in Calcutta. The inquiry showed that an index number for cotton manufactures based on a wide selection of representative varieties could be easily worked out If the cotton mill industry itself would undertake this work, it could base the index on a large representative selection of varieties of cotton manufactures—larger than can be included in an all-India index—and such an index number of prices would be of immense value to the industry itself as well as to the public and the Government. Details about the base year and the method to be followed need not be discussed here as these could be settled easily once the proposal is favoured by the industry and it is decided to put it into practice.

Prices of Securities of Some Important Mills

Prices of ordinary shares of the more important and representative mills would indicate the market view of the present and future profit-earning capacity of the industry as a whole. In the Securities Index Number published in the Monthly Survey the group comprising cotton mills shares is fairly representative and this may be found useful as a starting point. But the number of scrips included in this index had naturally to be small as the index covers all classes of securities. A special index number for cotton mills shares only can comprise a much wider selection. Quotations of shares of most of the representative mills may be taken for this ındex. The selection of representative shares can be easily done by the industry, and in Bombay, which is the chief share market for cotton mills shares, the leading share brokers can be called upon to help in the matter

Orders Booked by the Mills

The total value of orders booked by the mills will be another good indication of the state of the industry These figures are available with the mills in the city of Bombay and it should not be difficult to have similar figures for Ahmedabad. If these figures were collected and added together, they would give a very good idea of the demand for the products of the industry These figures must, of course, be collected confidentially and published so as not to disclose the identity of any of the mills, but consolidated figures for Bombay and Ahmedabad would serve as well, and if the Millowners' Associations of these two places could supply them, then the index could easily be worked out.

Stocks with the Mills

The fluctuations in the volume of stocks in the industry are a very good index to the condition of the industry. The Indian Jute Mills' Association publish such stock figures monthly and they are found very helpful in shaping the policy of the industry. Such stock figures are available with the Bombay mills and they could also be obtained from the Ahmedabad mills. If the aggregate stock figures are published, they would be very useful to the industry itself for regulating production. In any case, they would be one of the best indicators of the state of the industry.

Employment

Statistics of workers employed are found to be very useful as an index of activity in the industry. In the United Kingdom, such statistics are available for a number of important industries. In India no industry has

thought it worthwhile to collect such statistics monthly. The cotton mill industry, especially in the Bombay Presidency, could, however, make a start and collect and publish statistics of men employed in the industry. The rolls of wages paid to the operatives are available in every mill and from these they can easily supply the number of men employed during the month. These employment statistics would be very helpful to the industry itself and would certainly serve as a very good index of activity in the industry

Statistics of wages cannot be collected monthly without great inconvenience, but such statistics ought to be collected at fixed periods. The Bombay Labour Office has carried out such inquiries but these have not been at regular intervals. If the industry co-operates there is no reason why such statistics should not be periodically collected. This is a matter for fuller investigation and in any case, such statistics will take some time in preparation and may entail considerable labour and cost. It may, therefore, be found impracticable to collect these figures on a voluntary basis

Imports

Figures of imports of cotton manufactures including piecegoods classified in great detail, are available every month and an index number of the import trade could be easily worked out.

Exports

Similar statistics are also readily available regarding the export trade in cotton manufactures and a corresponding index may also be constructed for this.

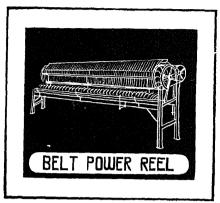
Profits

Profits are declared on the working of one year and these figures would therefore be available only annually The index of profits of cotton mills could easily be worked out on the chain index method and this would be a good indicator of conditions in the industry during the immediate preceding year. Such an index for about 58 to 59 mills is worked out in the Review of Trade. A larger number of mills could easily be included if their balance-sheets were secured regularly.

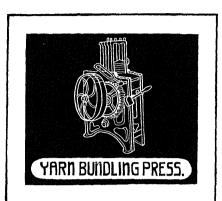
In the above paragraphs an attempt has been made to indicate what series of statistics and indices could be readily worked out if the business concerns and interests in the cotton mill industry co-operate. A journal like the *Indian Textile Journal* could easily undertake this work, as it should not be difficult for it to secure the co-operation of the cotton mill industry in the Bombay Presidency where the industry is largely localized. These series would serve as very good indicators of activity in the cotton mill industry. Their usefulness to the industry itself is unquestioned. In determining the policy that the industry should follow at any time these indices would be found to be invaluable. They will also prove useful to the Government and to the public as they would show the condition of the cotton mill industry at any particular time and the more light there is, the less chances there are for misunderstandings Light is the best antiseptic against prejudice and shortsighted self-interest. Light, more light, is the cry of every scientific worker or social administrator or reformer. By avoiding light no good can ever come; rather a great deal of harm. Every enlightened industry, therefore, should endeavour to its utmost to throw more light on its condition and its working, and what better light can there be than the one provided by objective

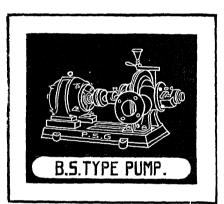
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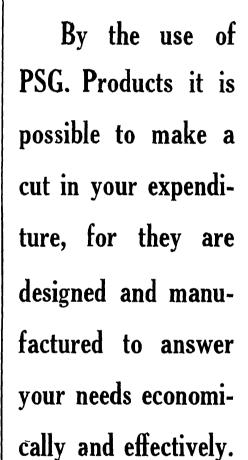
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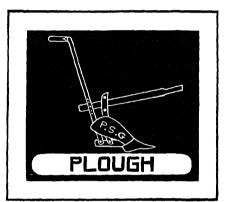
















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Factory Legislation and Textile Factories—(Concluded from p. 89) penalized combined with a more humane attitude to the weakest element in the industrial structure, have led to reductions elsewhere. It can be said without fear of contradiction that child labour is not sweated in any textile mill in the Province and in the two principal centres only eight children are employed. When this figure is compared with 9,664 in 1920, the improvement is obvious.

A second great advance has been in the direction of what is usually called "air-conditioning"

Ventilation Problems

The ventilation committees of thirty years ago were upset by the bombshell hurled at the Public Health world by Sir Leonard Hill and to a rapid change-over from the chemical to the physical theory of ventilation. The Adviser on Humidification who was appointed in 1921 recommended a standard based on the wet kata cooling power of the air. This is measured by the kata thermometer or "comfort meter" with which the name of Sir Leonard Hill will always be associated. Although it is difficult to prescribe a legal standard, the principle of providing adequate cooling has been accepted. A lot of experimental and practical work has been carried out in the last twenty years and although the first modern plant was installed in Sholapur, Ahmedabad did not take long to appreciate the benefits. The natural conditions of Bombay are more suitable to spinning and weaving than those of the hot and dry centres and it has taken some time to convince the local industry that air-conditioning is not a philanthropic measure. It is, however, only fair to state that progress has been hampered by economic conditions and strikes, but more progress has been made in the last five years than during any period of its history. The textile industry has spent about Rs. 50 lakhs on "air-conditioning plants. The results are better technical working conditions, increased production and earnings, greater contentment, and better health. An average weaving shed of 20 years ago was a closed room into which an atmosphere resembling a London fog was introduced by humidifiers, many of which did not introduce any air at all. In most of the sheds the air is now changed every four to five minutes by means of fans drawing or blowing outside air through sprays of water. The air is thus cleaned, cooled, and saturated before it is passed into the shed. One drawback to the textile industry is the high temperature common to several centres. But weather is now "manufactured" and some mills, owing to difficulties of site, have actually sacrificed looms to install cooling chambers inside the sheds.

The period under review has led to a change in the relations between capital and labour. It was not an uncommon thing 25 years ago to find those in authority advancing money at a high rate of interest or conniving at others doing so. There is, to-day, a far greater appreciation of the difficulties of the average millhand and whilst the advantages of co-operative credit have not been fully appreciated by owners and men, some very creditable assistance has been rendered and a lot of really useful work has been and is being performed by the office-bearers of such societies. Bombay has led the way in this direction but useful societies have functioned in other centres, and Ahmedabad has recently entered this particular field. The possibilities are

enormous and the appointment of labour officers in many mills should help the movement. Their appointment should also help to weaken the power of the jobber and lead to better relations between employer and employee. A very wise step was taken by the Millowners' Association, Bombay, some years ago by the creation of a post of Labour Officer and by the regulation and control of the *badli* system whereby fairer conditions in connection with engagements, dismissals and leave were established. The Standing Orders were also revised, standardized, and liberalized, and have recently been reviewed by the Industrial Court.

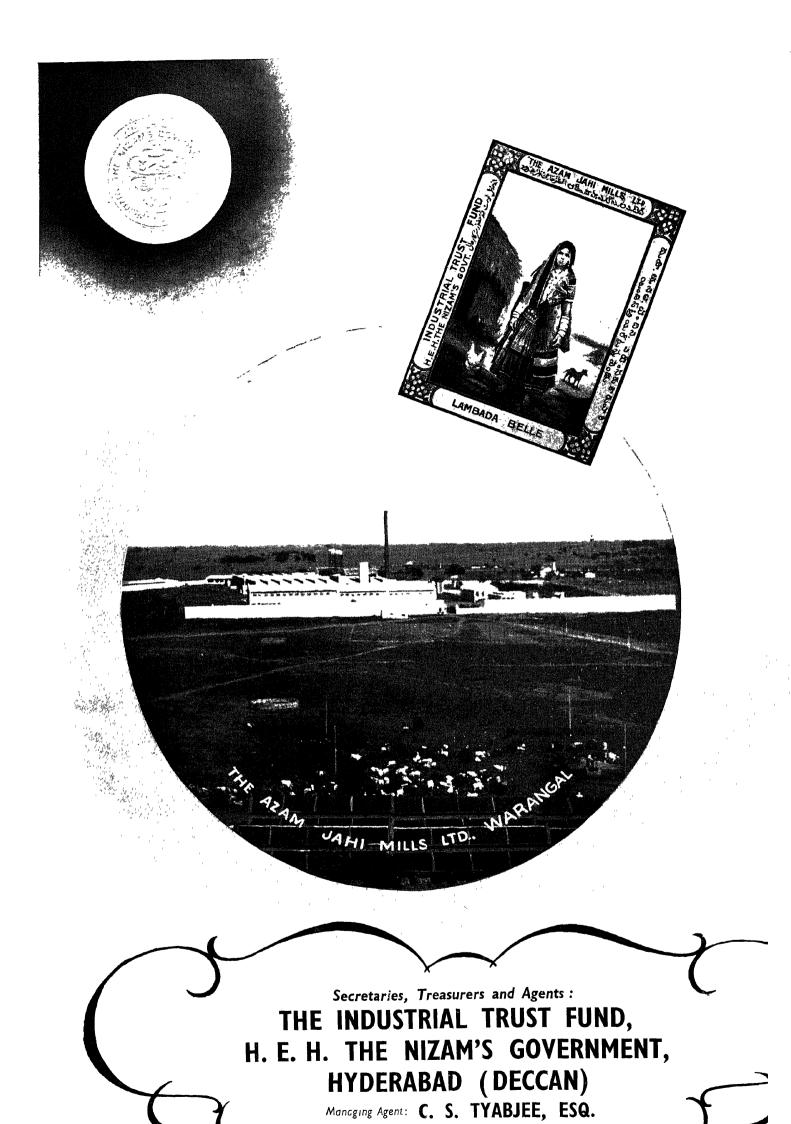
Welfare activities that were formerly confined to a few well-defined groups have extended, although there is still a lot of unevenness to be found and considerable scope for further efforts. A suggestion to a mill agent of the old school some years ago to provide a creche was immediately turned down on the ground that he himself was "brought up" on the floor. Cots for the infants of women workers were too "advanced" for him to contemplate. There are now over 100 textile mills with creches for the use of the infants of working mothers and the opium drugging of infants has been very materially reduced. "Time marches on" and the payment of maternity benefits by employers has very materially assisted the women employees in the textile industry.

The above review will indicate that the lot of the textile worker has very greatly improved in the last half century. His hours of work have been materially reduced and he is not fleeced to anything like the same extent by the parasitic members of society. He can obtain leave with a reasonable security of getting back the job on his return, the conditions under which he works have been vastly improved and made safer, and his children are no longer exploited in the mills.

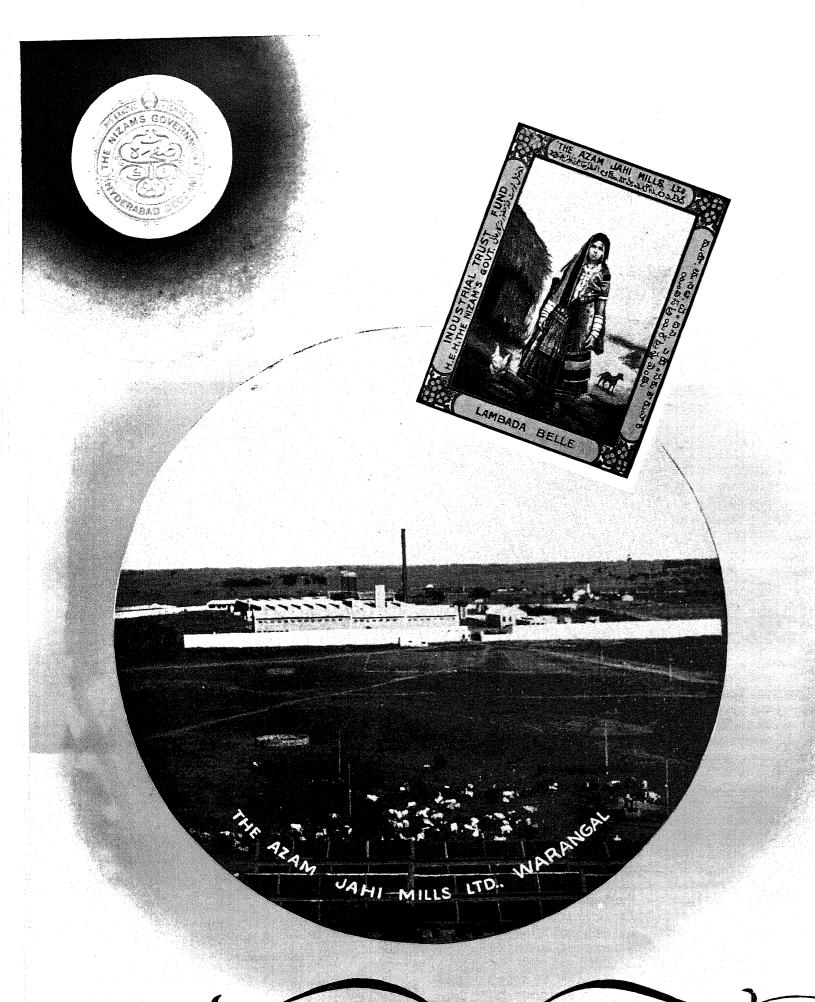
The infants of the women working in the mills are carefully looked after in the creches so that there is no excuse for the opium drugging that was so common 20 years ago and despite the statements that are sometimes made to the contrary, the mills have met, in a fair spirit, the obligations of the Maternity Benefit Act despite the fact that they have to bear the whole cost. It is hoped that the future will witness an increase in the provision of medical aid, a further development of "air-conditioning" and further efforts to control and prevent indebtedness.

Indicators of Business Activity in India—(Concluded from p. 225)

facts and statistics? The cotton mill industry which is one of the oldest and most advanced and probably the best organized industry in India should lead the way in this pioneer work. As has been shown above, the task is not at all beyond its power. The other industries can then follow suit and India will have adequate economic and statistical data for most of its important industries. It is in the hope that a technical periodical like the *Indian Textile Journal* should initiate work on these lines that this article is written and the writer feels sure that the *Journal* will rise to its opportunities on this auspicious occasion of its Golden Jubilee.



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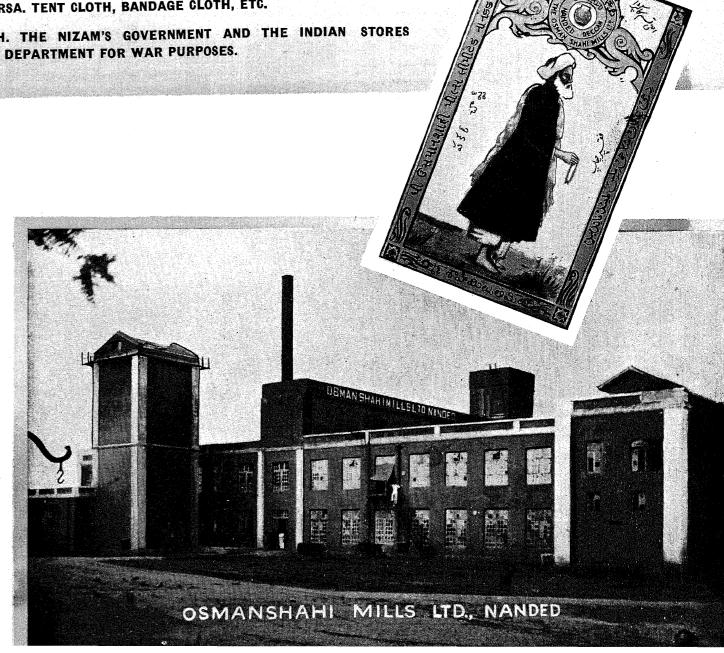
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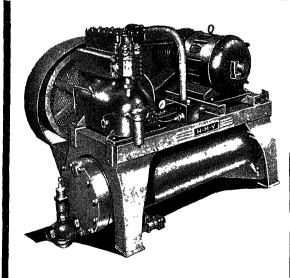
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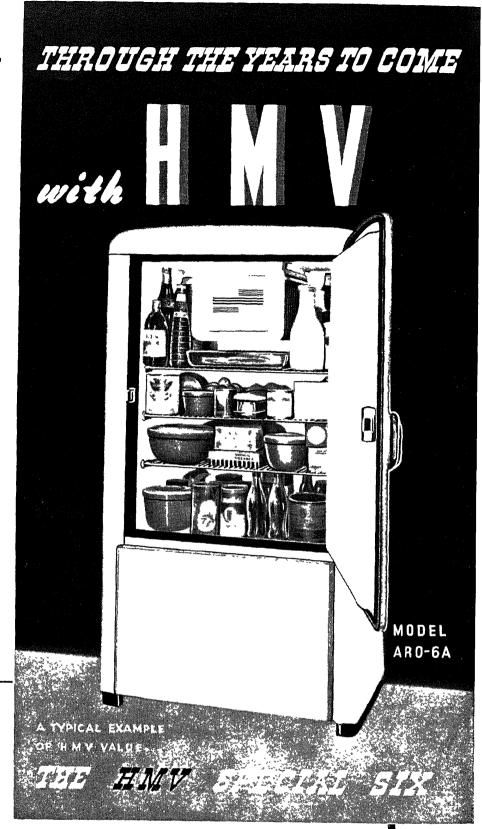


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Progress of Artificial Silk—(Concluded from p. 67)

of artificial silk yarn had grown to the figure of 1,170,989 lbs valued at Rs 42,39,979 and continued to steadily increase, reaching the figure of 7,962,546 lbs valued at Rs. 82,24,621 in he fiscal year 1931-32. As the outcome of protection given to artificial silk weaving in India by the increase of duties on artificial silk fabrics from 1st October 1931 to 50 per cent. ad valorem and the imposition for the first time of alternatively applicable specific duties of four annas per square yard, the consumption of artificial silk yarns took a sudden jump to 11,002,093 lbs in 1932-33, and continued to increase, to reach the peak of importations in the fiscal year 1937-38 at 31,589,038 lbs. valued at Rs. 2,05,34,793 following upon readjustment of duties on 1st April 1937 which brought the specific duties on fabrics of artificial silk to 5 annas per square yard The tremendous impetus given by these duties to the production of artificial silk fabrics in India is evidenced by the extent to which cotton mills are using the yarn to enhance the appearance of fancy cotton goods, and by the numerous artificial silk weaving mills which have since come into being Unfortunately developments appear to have outpaced the supplanting of foreign imports of fabrics, and since late in 1938 and up to the outbreak of war, a state of intense competition between artificial silk weaving mills in India for disposal of their products was very evident. The industry, however, is fundamentally sound, backed by technicians who have obtained an intimate knowledge of its technicalities, and directed by men experienced in commerce who do not appear to have despaired of the possibilities of combining to attain some uniformity in wages and selling arrangements, as is shown by their readiness to co-operate through the medium of their recently formed association.

Recent Changes

Of late, many changes have taken place on the merchanting side of the artificial silk yarn business Several of the merchant firms concerned in the initiation of the business, relinquished their interests when the principal Italian manufacturers, who since 1925 have been the main source of European supplies, decided to concentrate their sales through one organization As many of these firms are, however, intimately concerned with the textile industry, and know, from past experience of the artificial silk trade, of the difficulties which must be faced if India is to continue totally dependent on outside sources for supply, one might be reasonably led to expect that through co-operation, their associations, and the research work of the Indian Central Cotton Committee's Laboratories, some attempt to produce artificial silk yarns in India on a commercial scale, will be made in the not distant future. There are many and almost insurmountable problems involved in this, but as India's technicians surmounted the problem of preparation and weaving, so might we expect that the genius of her chemists will in the end prevail. One thing they need to remember is, that India with her seasonable rainfall, has little or no water to spare for pollution in industrial processes. Therefore, whatever the trend of research, it must be towards a process of manufacture which does not involve pollution of large quantities of water with industrial chemicals.

The low grade cottons of India offer a suitable raw material for the production of artificial silk, but if this is to be made economically possible, it will be necessary to ignore the question of "staple" and develop the cultivation of some species of cotton giving a sufficiently high yield of cellulose per acre so as to allow of its

being marketed in competition with wood-pulp. In America cotton linters have been used to a large extent in producing artificial silk, and the use of linters has only found its limitations in the quantity of available supply at prices comparable with that of wood-pulp. It is not to be expected that any real developments will take place towards establishing an artificial silk spinning industry in India until a raw material of the foregoing nature has proved itself economically and quantitatively available Those concerned with cotton cultivating interests need not be deterred from going ahead with developments towards producing such a raw material owing to there being no artificial silk producing factories in this country to offer a ready offtake, for, if enquiries were made in overseas markets, it is not inconceivable that it will be found there is a large ready demand for a cheap cotton which would provide the cellulose requirements of many countries. To put the matter briefly-India is already a large consumer of artificial silk yarns, and an industry producing these would rapidly follow on the appearance of a sufficiency of raw material, providing there are assurances of reasonable protection during the period of developments.

In a long association with this industry, some useful hints have been garnered from the men who have brought it to its present stage in India. The most important of these is that one must learn to appreciate that viscose artificial silk is produced in qualities and filaments to suit different requirements, and like many other products, some variation is to be found in the productions of each individual factory Therefore, if even dyeing and finish is aimed at, it becomes a good rule never to use warp or west of mixed yarns In deciding upon the best yarn for any particular fabrics manufacturers should be asked what they can offer for the purpose, and once a decision has been made, changes should be avoided, for these very often give rise to the costly necessity of running previous supplies off machines to avoid mixtures, and will very likely require alteration of dyeing formulas and finishing processes

Fifty Years of Rope Driving—(Concluded from p. 135)

outlook. A word of warning is necessary. These modern high speed short-centre rope drives depend upon highly specialized technical knowledge for their satisfactory installation. Often they look like many other rope drives but in fact consist of ropes and pulleys of a vastly different detailed construction. For example, the groove angles used are considerably keener than those advisable for larger drives. The pulleys in fact are an integral part of the drive. There is only one safe rule at present for short-centre high-duty drives-" consult the specialist " and, perhaps we should add, " accept his advice." In Great Britain large numbers of these drives have been installed in the last eight or ten years and the leading firms specializing on short-centre rope drives know what they are doing, they have a wide range of experience to draw upon for technical data. If they will back a drive with their name and reputation it is fairly sure to be sound. In India there has in the past been much hindrance to progress in power transmission through a tendency to cling too long to old, conservative rules of practice. It should not be good enough for Indian technical practice to follow the rest of the world; in power transmission at least India should be doing to-day what is found best in other countries.

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Banks and the Cotton Industry—(Concluded from p. 39)

industry, while at the same time safeguarding, as far as possible, their own concerns

For general finance money is advanced in the form of cash credits. These credits are usually for twelve-monthly periods with a fixed maximum amount and a fixed rate of interest. The security required is on the fixed assets of the company, such as land, buildings and machinery, countersigned by the agents as the "case of need." In the event of the mill company being unable to retire the loans on due date, the agents are called upon to pay up the amount outstanding forthwith. These loans usually carry a half-interest clause.

In extraordinary cases either for the heavy purchase of raw material on the one hand, or owing to the accumulation of heavy stocks on the other hand, fixed loans are frequently required and taken on the liquid assets of the company. These assets are generally put into godown and assigned to the bank, who have the right to inspect and count them at any time.

A tale is told by the bankers in this connection, of a visitor being shown round the godowns of a certain mill. He prodded the bales somewhat imprudently with his walking stick and asked, "What are these?" The godown-keeper raised his hands in horror and cried, "Be careful. Those are all rotten." Then why do you keep them?" asked the visitor. "Oh, those are the bank's security, and have to be counted by their young man when he comes on the first of the month," explained his guide. This may be all right for a tale, but any millowner knows that credit rarely goes to the uncreditworthy.

In very bad times and hard cases, when markets have been persistently bad, it becomes necessary sometimes to mortgage the mill. This is a last resource as it precludes borrowing for running expenses from banks except on liquid assets.

Changing Markets

Cotton was originally collected at the ports for export to Europe. The Bombay spinning industry owed its rapid rise to the heavy demands for cheap yarn from China, which country had at that time an extensive handloom industry and no cotton mills of its own This good trade flourished uninterruptedly, with certain vicissitudes, until the Government of India put a tax on silver. The Bombay mills were thus placed in an unfavourable position compared with the now growing Chinese and Japanese industry. Seeking another outlet, the Bombay mills with considerable difficulty had to spend large amounts to develop the weaving industry and turn their surplus yarn into cloth. This was a very critical period in the history of Bombay, and but for the generous support of the bankers few spinning concerns would have weathered the storm.

The China trade having been lost, the trend of the mills was again towards the interior where less expensive land, and cheaper labour, added to nearness to the cotton fields and the agricultural clientele, enabled the Indian mills to compete to some extent against the influx of cheap Japanese cloth. The cotton industry is thus widespread over practically the whole of India, and the larger banks have opened many additional branches to facilitate the extension of this commerce. It can thus be seen that without the enormous assistance given by the banks to the cotton industry, probably less than half the mills could have been floated. When one considers the numbers of workpeople that the average

mill employs, the social benefits which accrue to these people through the mills, one can appreciate the advantage which the banking system has been to the poor man.

For every lakh of rupees paid out to shareholders and agents by the mills, at least a crore is paid to work-people.

The combined efforts of banks and millowners have been able to absorb the ever-increasing population of this country, and tide it over the universal metamorphosis from the purely agricultural to the industrial era.

Mill Buildings in India During the Past Quarter Century-

(Concluded from p. 113)

and construction of these creches for the health and well-being of the children of the workers in the formative years of their lives.

Conclusion

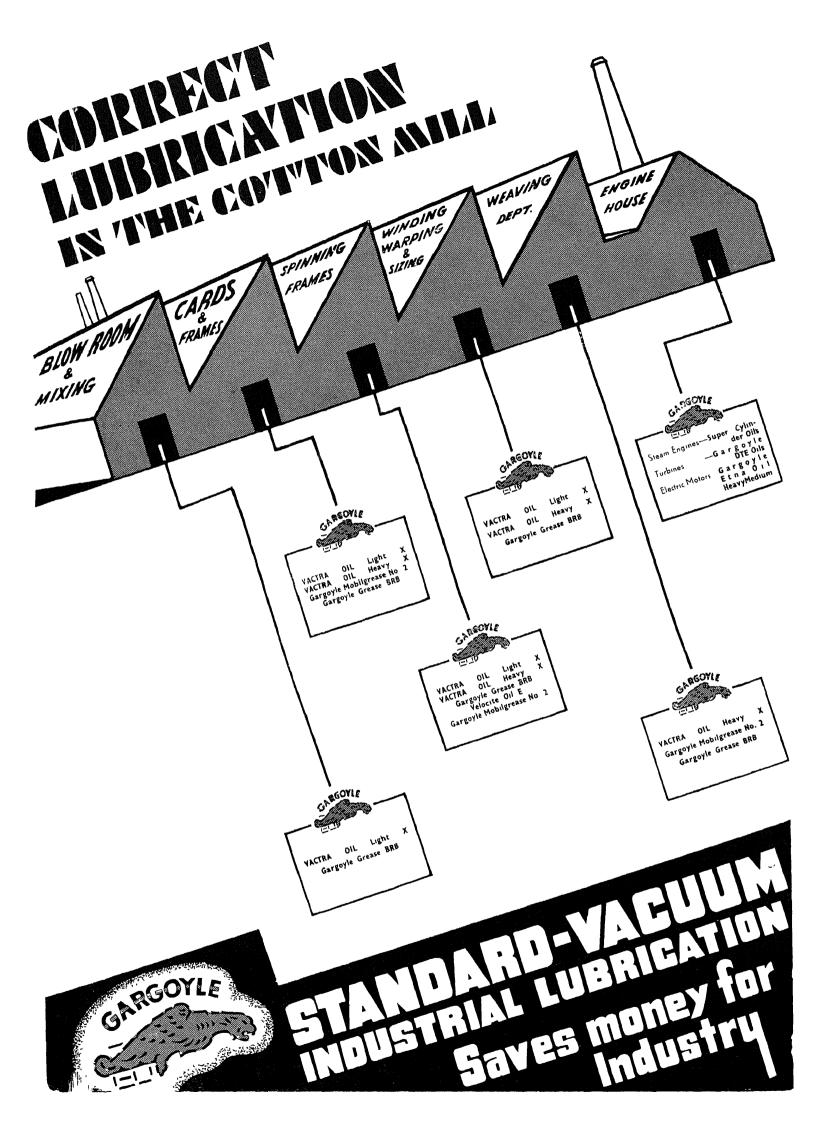
Looking back over the past quarter of a century, one must come to the conclusion that there has been very little change in the design and planning of the mill buildings. Here and there we see the old horizontal steam engine standing idle but polished and oiled, as in days of yore, relics of the past. In some mills we see the turbine installed and proudly attended to by the engineers. In other mills we can discern the old enginehouse but inside we find it converted into godowns, yarn drying, or other purposes for which such accommodation was required. Transformers, all built very much on the same style because the plans are drawn by the electric company giving the specialized accommodation required, may be now seen in most of the mills where electric power has been introduced, and, because of that fact, these buildings can very readily be picked out from the remainder of the structures.

In some mills since 1920 we see here and there the introduction of reinforced concrete in an attempt to replace steel roof trusses, but the writer has never advocated this form of construction for mill buildings and it is very evident that it has not found favour to any extent with others connected with the mill industry.

Domestic architecture is striving after something new and is possibly, or at least we hope, passing through a transition period, but the same opportunity for adopting new ideas has not been afforded to architects who have been called upon to deal with mill problems, for reasons which must be obvious to all.

I have, however, shown how in some instances mill structures can be made architecturally attractive, and it is hoped that, where opportunity arises, millowners and agents will collaborate with the architects in an endeavour to achieve this object.

What will happen in respect of the development of mill buildings during the next half century is difficult to foresee, but looking to the designs of the more recent mills and factories erected in England and on the Continent, the architects have been able to design attractive schemes, but this can only be effected by the co-operation of the companies concerned. All buildings regardless of whatever purpose for which they are designed can be made to look functionally correct and a pleasure to gaze upon.



Rationalization in Textile Industry—(Concluded from p. 32)

contrary to the interests of the mills, the growers and the public generally. Far from being a force in the market by virtue of consuming 60 per cent. or 70 per cent, of the cotton grown in the country, the mills are now at the mercy of the market. The Japanese have a highly developed organization for making cotton purchases not only in India but from other cotton-producing countries of the world, and by playing one against the other at times they benefit themselves. A purchasing organization on the Japanese lines is one which the mills in India might well imitate. A further advantage of a central purchasing organization would be that adequate and satisfactory tests of raw cotton could be conducted on the various types before purchase. Savings in the price paid for the raw material, savings in transport charges owing to a more rational distribution, and savings in the cost of purchase such as agency commissions, etc., will all materially contribute to a lowering in the cost of manufacture and to a strengthening of the mills' position, making them more virile units in our industrial system.

Rationalization in its application to capital reorganization involves the elimination of inefficient units. Although admittedly there was overcapitalization of the industry in some parts of the country soon after the last war, it does not appear that the problem exists now, at any rate, to any appreciable extent.

Rationalization in the sphere of labour is recognized to be a vital element in the scheme for the improvement of the economic efficiency and the competitive capacity of the industry. A high degree of skill and an intensification of individual effort are as greatly dependent upon the worker himself as upon the conditions under which work is performed and the facilities which the employer affords for recuperation from fatigue. It is here that welfare work plays its part, and though its value may not be assessable in terms of money, employers who have introduced welfare schemes have been convinced of their efficacy in contributing towards increased efficiency. Developing internal consumption and export markets calls for a reduction in manufacturing costs, and the efficiency of the worker which will reduce costs correspondingly is an important factor.

Another not less important sphere for rationalization is the distribution of the manufactured product. Selling does not consist merely in disposing of the goods but in giving service and thereby retaining custom. Manufacturing efficiency by itself is not of much avail unless it is accompanied by its essential counterpart, an efficient sales organization. Vigorous selling policies are made possible by price reductions financed out of more economic and efficient production. Industry is not made rational merely "by graphs, statistics, index numbers and trade forecasts but by the development of the ability to read their lessons and apply them successfully." Undue dependence on a sheltered local market is apt to produce a certain amount of complacency and to weaken the incentive to progress and improvement, but if a mill were exportconscious the influence of outside competition will tend to keep it keyed up to a high pitch of efficiency and to prevent it sliding back to less efficient methods. It is true that there is internal competition but the mills all operate in a more or less artificial market. The time is particularly ripe to expand our exports, and if the industry can increase its efficiency and its capacity to meet competition in foreign markets as a result of rational policies, we would not only secure but retain our foreign markets

when the war is over and when more intense competition will have to be met.

Research is an important aid to rationalization, and here again joint and co-operative action on the part of the mills is desirable. A fully equipped research institution is a costly affair, but financed jointly its incidence is not likely to bear heavily on individual mills, and many of us are aware of the valuable services which the Shirley Institute in England has rendered to the industry of that country, particularly in the field of the use of different cottons separately and mixed with each other, in the field of sizing and in the elimination of processes, and simplification in other branches of manufacture.

Rationalization is not merely carrying out improvements in the several departments of a mill but it also implies co-ordination, that is, adjusting the balance between all the departments. It is to be hoped that the *Indian Textile Journal* whose continued prosperity is associated with the fortunes of the industry, will carry on a campaign of "rationalized industry for an irrational one." The above suggestions may seem the veriest of platitudes, but no apology is made as some profound truths are to be found in the commonest things. As being the major edifice in the country's industrial structure, it is the duty of the industry to deserve its premier position by reorganizing its units on a more efficient footing

Textile Worker's Health and Problem of Medical Aid-

(Concluded from p. 105)

the large number of cases suffering from neuritis and muscular rheumatism due to want of vitamins B and B complex. Again, turning to eye diseases, although acute and chronic ophthalmia are the commonest of eye troubles, there is a large class of cases that suffer from night blindness which get cured if the vitamin A deficiency is cured by proper drugs and food. Polished rice consumption is a potent cause of vitamin deficiency.

Tubercle is distinctly on the increase and a large number of lung cases from the blow-room are of lung cirrhosis whilst acute and chronic bronchitis and emphysema form the major portion of lung troubles.

Of the gastro-intestinal diseases a fair portion suffers from duodenal ulcers, a small percentage from appendix trouble whilst an enormous number suffer from acute and chronic dysentery and chronic gastric catarrh. Anæmia, acute and chronic, is to be found in a large proportion of men and women and by far the major part of it is due to malaria. Of the ear cases, there are varieties of diseases from inpacted cerumen to mastoiditis to be seen. The advent of sulphanilamide has been a real boon to the mastoid cases and has given wonderfully good results. Chronic and acute middle ear catarrahs and furuncules of the external ear together with fungi infections make up the bulk of ear diseases.

On the whole, there is great improvement in the quality and quantity of medical help that the textile worker of to-day receives as compared to what he did 25 years ago but, as I have said before, there is great scope for much further improvement and the one institution to which one may look to for this is the Millowners' Association, Bombay. There are many millowners who are men with big hearts, noble minds, courage and understanding, who will one day take up this matter in earnest, and of that I feel sure.

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American Gotton Work in Punjab and Sind—(Concld. from p. 53) black seeded type. The total American cotton area in the Punjab, Bahawalpur and Sind last year is given below:—

Punjab and Bahawalpur .. 400,000 acres 289F selection K25 mainly and also 43F .. 120,000 acres L.S S 700,000 4F Sınd N T. 289F .. 250,000 .. 150,000 4F type ..

As late as 1929-30, according to the East India Cotton Annual, the total area under American in Sind was only 27,000 acres or, say, 12,000 bales. It is only since the Lloyd Barrage has been completed that really rapid progress has been made. The total area under American in Northern India including the Punjab, Bahawalpur and Sind now varies from $1\frac{1}{2}$ millions to 2 million acres annually and a total crop of from 8 lakhs to 10 lakhs bales

Saw-gins

Formerly all cotton in Northern India and Sind was roller ginned, the common type being the double action single roller of Platt Bros Up to 1918 there was only one saw-gin plant in Northern India and that was put up by Sir Ganga Ram at the writer's suggestion at Jaranwala in Lyallpur District. It was only used experimentally and was sold to Ralli Bros for Khanewal about 1921. While on the Mackenna Cotton Committee of 1917-18 the writer constantly pressed for saw-gin development as there appeared to be more hope of improvement in that system than with roller gins. America, the greatest cotton-growing country in the world, gins almost its whole crop by saw-gins. The sample from saw-ginning is cleaner and the cost of ginning was known to be less than with roller-gins. From 1923 onwards the writer, having had two years' practical experience at Khanewal, started taking a hand in this development and put up one set at Khanewal in 1924, and subsequently increased it to two sets. Saw-gins were also put up by the writer at Burewala, Vehari, Mailsi and Sadıkabad and lately ın partnership with the Bombay Company at Jhudo, in Sind. There are now at least 40 sets of saw-gins working in the Punjab and Sind. All saw-gin cotton was at first exported, but Messrs. Sassoon of Bombay started getting interested in saw-ginned 289F and in 4F saw-ginned about 1928. In the last six or seven years Cawnpore has been a good buyer of sawginned cotton and now buys comparatively little roller ginned Punjab American. Up-to-date Bombay and Ahmedabad have been reluctant to buy saw-ginned cotton though all American imports are saw-ginned. For this reason saw-ginning in Sind, whose produce is bought mostly by Bombay and Madras, has not made much progress. The next few years will see a change.

Delinters

Another notable development is the installation of delinting plants. It is estimated that at least 40 delinting plants are in operation now. Within the last four or five years the crushing of cottonseed to extract oil has started developing and there are 8 or 10 such plants now in operation, all of which also possess one or two delinters. Up to the present, linters have been mainly sold locally for filling of quilts and warm waistcoats, etc., but some has been exported to Europe.

In all the work on American cotton in the Punjab and Sind, very valuable assistance and financial support has been forthcoming from the Indian Central Cotton

Committee. It is still carrying on the good work and will undoubtedly in time bring about vast improvements in the quality and quantity of long-staple cottons in North-West India so urgently needed for the healthy development of the Indian textile industry

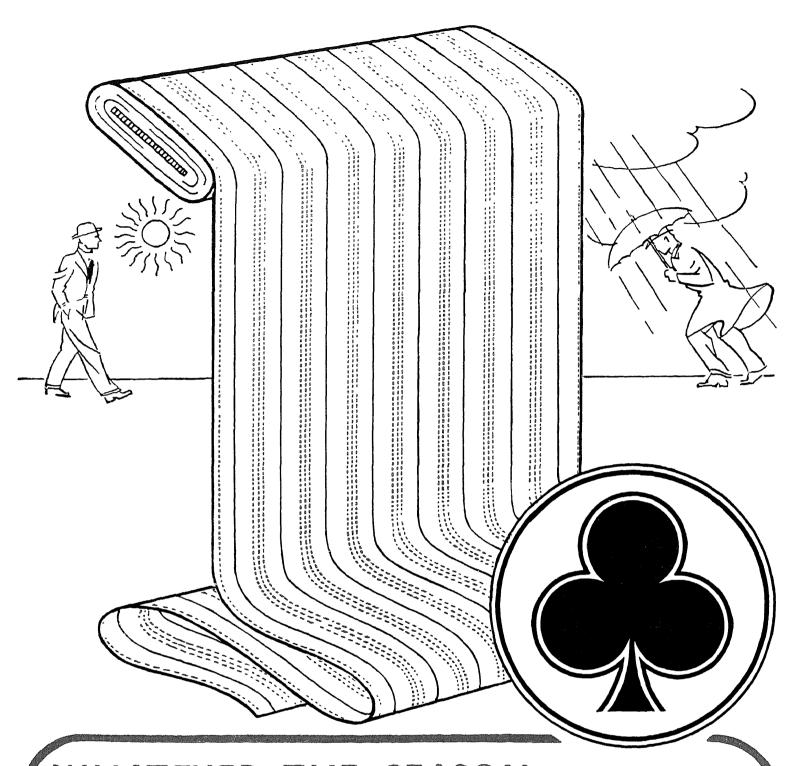
Cotton Spinning in South India—(Concluded from p. 149)

quantities Weaving mills also turned their attention to the purchase of yarns at cheap prices from southern spinners while weaving mills without spinning machinery began to make their appearance. The rapid growth of the hosiery industry in India, particularly in Bengal, offered an additional outlet which was eagerly seized

The lines of future development are difficult to forecast We are repeatedly told that the handloom weaver is in danger of extinction, although the yearly total of yarn consumed by handlooms is still around 400,000,000 lbs There is real scope for an intensive survey of the handloom industry, so that definite facts may be gathered and policies determined. Most Provincial Governments in the past have stood out against the spinning industry's claims for reasonable protection, basing their stand upon sentiment but without taking the trouble to gather actual material. Conditions vary considerably from Province to Province and it would appear best that any inquiry undertaken be conducted by the Government of India Such an inquiry could also look into the results of the subvention in aid of the handloom industry. The Government of India has been paying some Rs 5 lakhs annually to help the weaving community but it is doubtful if the money is being used to the best advantage in a number of Provinces Madras is making progress with its allotment but the pace is

Something has been said of the development of the spinning industry in the south but the record would be incomplete without some mention of our cottons. Tinnevelly cotton has been a well-known name for many years. One reads in a history of the well-known firm of Parry & Co., Ltd., how Madras merchants 150 years ago brought Tinnevelly cotton by bullock-cart some 300 miles to Madras, to be exported to England by sailing ship This variety is largely grown in the black cotton soil tracts of Madura, Ramnad and Tinnevelly Districts, while the longer stapled Karunganni of these districts has also been fostered of late years by spinners and the Agricultural Department. The most important development on the cotton side, however, was the introduction, 30 years ago, by Mr. Alexander Steel of Messrs. A and F. Harvey of Cambodia cotton which now covers many thousands of acres in Coimbatore District's irrigated tracts. Improved strains have been evolved by the Madras Agricultural Department and the economic life of the south considerably enriched thereby.

It is sometimes said that the cotton industry in India has reached saturation point. Such a view can never be accepted so long as women can be seen washing part of their only *sari* in tanks and streams while clutching the other hali round them. In the further development which is necessary adequately to clothe India's teeming millions, the spinning industry of Southern India will play its part.



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Future of Bombay Cotton Mills—(Concluded from p. 141)

The mills of this Presidency have a strong case for cancelling the interim increment granted on the recommendation of the Bombay Textile Labour Inquiry Committee and the Bombay Government, who imposed this burden upon the industry, should re-examine this question in the light of the conditions through which the textile mills have since passed.

Rationalization schemes have made some progress in Bombay mills in recent years, but it must be realized that much remains to be done in this direction. It must be recognized that the cost of labour charges per unit of production is already so high that it leaves little room for any direct increment in wages, but while the various rationalization schemes might enable the mills to compete more freely with highly industrialised countries like Japan and the United Kingdom, they might at the same time enable labour to increase their income substantially. If India is to take her rightful place among the industrial countries of the world, labour will have to make substantial progress towards efficiency and Bombay being the pioneer of the textile industry must take the lead in increasing the efficiency of labour.

It is in fine and fancy lines that the Bombay mills can successfully cater for the home market, and undoubtedly both Bombay and Ahmedabad have made rapid progress in these lines during recent years. Such lines require great technical care and attention in the process of manufacturing as also efficient and up-todate plant. Some of the progressive mills have made important changes in their plant and machinery and they are in a position to compete successfully against up-country and foreign manufacturers. But unfortunately little attention was paid by the mills in the postwar boom period to replace their old plants and hence the average mills are finding it very hard to maintain their position. Due to the present war, any plan of large-scale orders for new machinery must be held up, but if any abnormal profits are made by the mills—the chances of which are, of course, very meagre—during the present war, sufficient reserves must be built up to enable machinery replacement after the war.

Besides the efficient plant necessary for manufacturing fancy goods, the marketing of such goods also requires great skill and an efficient sales organization. It is easy to dispose of plain grey goods in bulk quantities, but for fancy lines, it is highly essential that the various markets of India for diverse varieties must be fully studied and mills must have their own sales organizations functioning in the different markets of this country to cater to widely differing tastes. Wide publicity to popularize the various sorts is also indispensable for a fancy mill. I submit that this important factor of marketing should be studied in all its aspects and mills should make the necessary changes to bring maximum returns for their products.

Regulation of Production

No large-scale industry can prosper unless the problem of over-production is solved. We are at present in a vicious circle. If the history of the last four or five years is studied, it will be apparent that there have been occasional prosperous periods which have led at once to intense night-shift working and consequent glut in the market, followed later by the closing of night shifts. This curtailment of production again ensures a healthy market, but only to be followed by depression. This process of overproduction and enforced curtailment would have assumed a very serious state but for this war. The war orders and the broadening of export

demand are at present stabilizing the market, but the issue is one which cannot be overlooked. The Millowners' Association, Bombay, is the premier organization of the textile industry of this country, but there are other organizations at important centres like Ahmedabad, Calcutta, Cawnpore and Coimbatore. Some co-ordination is essential between these bodies if the issue is to be successfully tackled; but the Millowners' Association, Bombay, will have to take the lead in this matter at the right moment.

The regulation of prices is always essential, but this issue assumes an added importance during the period of a falling market. One mill after another is forced in the race of price-cutting by interested parties and some sort of combination would prove extremely useful in such periods. The difficulty of this problem is fully realized in view of the fact that even for certain standard sorts, different mills get different prices on the merits of their respective qualities. I am not advocating an all-India scheme in this connection, but some machinery might be possible for Bombay mills through the Millowners' Association whereby different mills manufacturing similar sorts could combine in separate groups so that some sort of co-ordination might be possible in times of crisis between manufacturers of similar sorts.

Note on Textile Industry of Baroda State-

(Concluded from p. 177)

Advisory Committee, etc. This Federation was ably represented before the Textile Tariff Board by the late Mr. Matubhai Kantawala and has representatives on the boards of several public bodies. It is affiliated to the Federation of Indian Chambers of Commerce and Industry, New Delhi, and the All-India Organization of Industrial Employers.

The Federation was instrumental in securing facilities for the importation into Baroda of different varieties of coal, kerosene, pig-iron, hessian, firewood, mahura, cereals, pulses, grass, etc., during the last World War (1914-18). In 1919, the Federation imported wagon loads of rice, bajra, etc., from Hathras, Cawnpore, and sold them to the workers below cost price. In 1925 it convened a united conference of factory owners and labourers to consider the Baroda Factories Bill and, as a result of this conference, the Factory Bill was postponed for some years. The Baroda Government has adopted a sound policy for the furtherance of trade, commerce and industry. This Federation had sent its views to the Government of Baroda on the Factory Act, the Income-tax Act, Payment of Wages Act, Trade Union Act, Trade Disputes Act, Maternity Benefit Act, etc.

The Federation generally takes up the complaints of the members and tries to solve their difficulties by approaching the necessary authority in the matter. The most important questions are the reduction in railway rates, reduction or refund from municipal octroi duty, water concession, etc. Members are helped by the Federation to obtain contracts from the State Departments

The Federation has made an arrangement with the Maskati Cloth Market Association and Panchkuva Mahajan, Ahmedabad, whereby all the disputes regarding the purchase of cloth from the member-mills by their members should be decided by a Board of Arbitration, the members of the Board being appointed by all the associations and one member from each side being nominated by the party concerned; the application has to be made through the Association.

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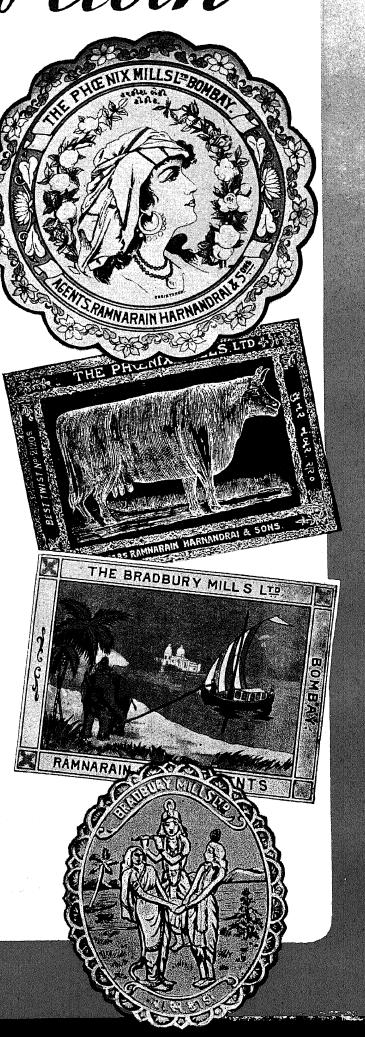
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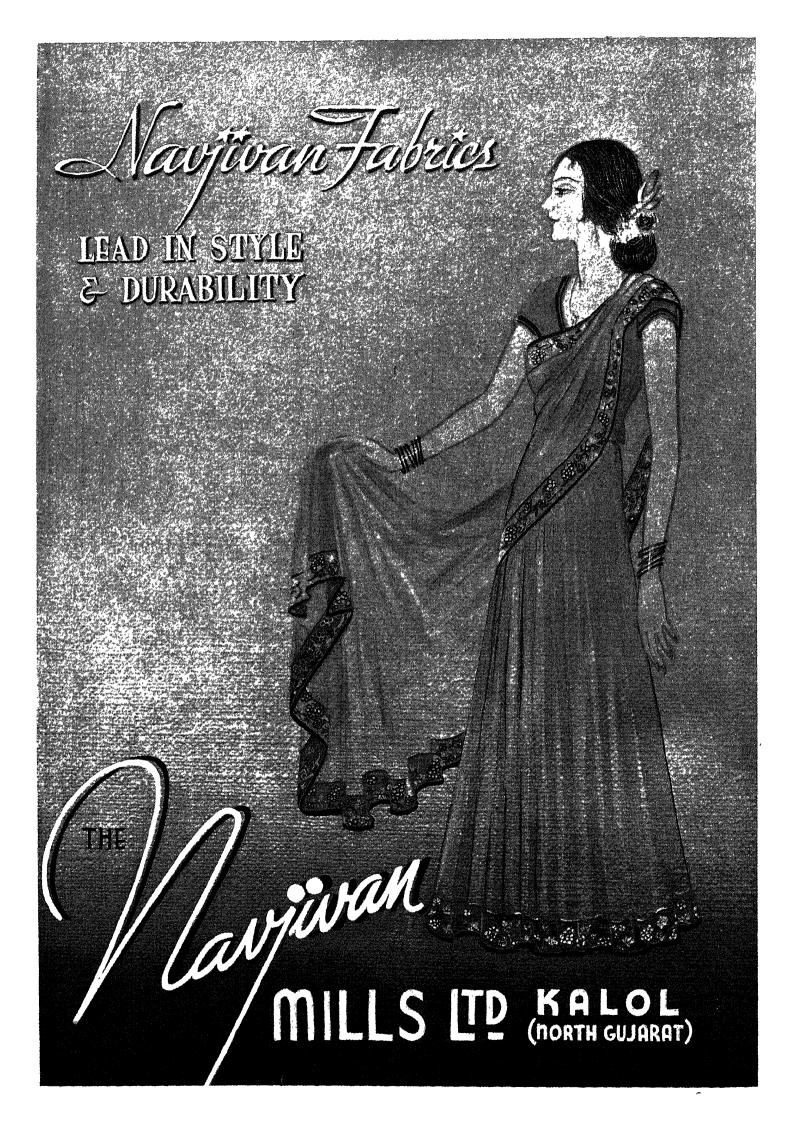
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"give," such as soft cotton cord, rather than the steel or rawhide pins which are usually provided "Alligator" lacing is good for general purpose work when no projection can be allowed. When made in Monel metal it is more expensive than the standard type, but it does prevent rusting. However, when the correct type of fastener has been chosen it is very important to see that the makers' instructions are followed when fitting. Many belts are ruined owing to improper squaring of the belt ends and the wrong size of fasteners being used.

Care and Maintenance

Flat beltings should not require much attention if they have been properly designed and installed in the first place, but the amount of maintenance needed can be considerable if a badly designed drive is put to work.

Leather belts and black impregnated solid woven belts should be dressed regularly on the back with a dressing which will not clog, but will feed and maintain the fibres. Such belting can be used as a reservoir for dressing which will keep the belt face in that permanently velvety condition which is so desirable. A bad dressing will clog up the belt fibres, clog up the pulleys, dry out and start to break up the belt. Balata and rubber belts cannot be treated with dressing to come through from the back to the face, but may have a very small amount of dressing applied to the face only. In mounting belts, clamps should be used on anything wider than 6 ins. The springing on of wide belts is not to be encouraged, and, where it has to be done, care should be taken to see that the edges of the pulleys are covered with something to prevent the belts being cut. Cases are known where the springing on of a belt has permanently elongated one side and caused the belt to run unsatisfactorily throughout the whole of its life. It is generally safe to follow the cutting short allowance which a good maker specifies with his belting; he should know the way in which his belting will behave when put to work.

"V" Ropes

"V" ropes take their name from their trapezoidal section, and have come into prominence industrially, primarily as a coupling between electrical motors and shafts or machines, although they are used to a considerable extent on other drives. Immense numbers of these drives have been sold since their introduction in 1928, and the "V" rope drive is a child of the electrification and individual drive urge. Their chief field of application is for drives from electric motors, but they are suitable for other drives, although centre distance adjustment should always be provided in view of their endless character and elastic nature.

"V" ropes fulfil the demand for a coupling providing necessary protection from shocks to motors and machinery, are reliable because if one of a multi-rope set breaks the others carry on; they work at short centres, save room and need no lubrication or dressing. They are especially good for textile factories because with them one can obtain smooth starting, acceleration and running.

"V" rope drives have the advantage of a new beginning, and have rightly become regarded as an engineering job, drive designing being done by suppliers even for large firms of high technical standing. Practically all the responsibility remains with the supplier, with the result that drives suffer very little interference by entirely unskilled workpeople (which does not apply to flat belts), and are thus often forgotten

entirely, due to their easy, trouble-free running and lack of necessity for lubrication or dressing. Care should be taken, however, to see that correct alignment and tension are maintained, and from more than nine years' experience it can be said that almost all complaints arise from one or other of these two omissions

The '' V '' ropes which are available differ only in their method of construction. They are :—

- (1) The rope which is made with an endless cord and rubber centre with a bias cut jacket.
- (2) The rope which has rolled fabric inside.
- (3) The rope which is made with concave sides.
- (4) The cog belt with cut sides and indentations on the bottom.

The cheaper type of rope can easily be detected by the fact that the cover is cut square instead of on the bias.

The ropes are genuinely endless and are vulcanized up in moulds. There are 80 stock sizes of "V" ropes manufactured, but, in actual practice, the ropes being produced do vary very slightly in length. It is therefore usual, in the case of manufacturers of repute, to assemble a set of ropes of the same length for any one drive, and this is done by testing the ropes on a machine until a matched set is obtained. It is not often that one sees a badly matched set of "V" ropes on a drive, but if one rope should happen to be considerably slacker than the remainder, it may jump the groove or turn over.

The difference from a power transmission point of view, between flat belts and "V" ropes is that the latter, by virtue of the fact that they are wedging in a "V" groove of 38° included angle, exert a larger total force against the pulley faces than the former. If we take a flat belt as unity, a "V" rope has a wedging effect in the grooves of 3. It is obvious, therefore, that "V" ropes must not contact with the bottoms of the grooves of the pulleys in which they run; if they do so the pressure against the sides is considerably reduced and the wedge effect partially or wholly lost. The question of the efficiency of "V" rope drives is of interest. Claims are made to the effect that these drives are 98 per cent. efficient, but it is unlikely that this figure can be maintained in practice. Observations lead one to believe that an efficiency of 90 to 92 per cent. may be reckoned upon for a correctly designed drive where the bearing loads have been kept reasonably low. The life of a "V" rope depends entirely on the conditions of each drive. Cereal grinder users expect 4,000 to 5,000 running hours from them, but are often satisfied with 2,000 to 3,000 running hours, considering the very high speeds at which they are running and the heavy shocks which they have to bear. A good deal of experience in fitting woodworking machinery and fans with "V" drives shows one that all those which have been correctly designed are good after five years of 48-hour week running. It is not generally realized that "V" ropes do not give the same length of life as flat belts. The reason for this is that "V" ropes are thick and have to run round smaller pulleys than flat belts. Furthermore, the short centres at which "V" ropes run cause a far greater number of flexings. In one instance, five 11 in. by 3/4 in. "V" ropes were installed to transmit 55 h.p. constantly on a blast furnace gas booster, where the customer (at first) expressed surprise at the breakage of the ropes after four months, although the "V" ropes had operated non-stop for the whole period in an average room temperature of 96° F. Each "V" rope had actually travelled, just over 100,000 miles and had bent and straightened on pulleys only $31\frac{7}{8}$ in. and $12\frac{7}{8}$ in. o.d.



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Welfare Work in Textile Industry—(Continued from p. 101) classes conducted by the Social Service League or the Victoria Jubilee Technical Institute Visual education is carried on both within the mill premises and outside the mills.

Practically all of the Bombay mills provide some sort of facilities for either indoor or outdoor games—or both—and sponsor various types of leisure-time activities such as "bhajans," dramatic performances, excursions and exhibitions. Eighteen mills provide partial housing accommodation for their employees, more than 40 mills have canteens, 12 mills provide tiffin rooms and 3 mills have boarding houses. Thirty-seven Bombay mills maintain their own dispensaries, which provide medical facilities for the workers and their families

That the Bombay millowners have an interest in the economic security of their employees is evidenced by the fact that 24 Bombay mills support a total of 41 co-operative societies; 15 mills have provident fund schemes; 10 grant some sort of bonus, and 11 grant pensions or gratuities to old employees at the discretion of the managing agents.

All of the larger mills in India comply at least with the minimum legislative requirements regarding sanitation, ventilation, drinking water, safety, creches, maternity benefit and workmen's compensation, and many of the mills are considerably in advance of the law. The most commonly accepted forms of voluntary welfare work are concerned with medical relief and housing.

A definite advance in recent years has been the appointment of both Government labour officers and private labour officers—extending the meaning of welfare from the provision of amenties for working men and their families to a serious attempt to deal with internal working conditions, workers' grievances and the promotion of industrial harmony. The outstanding development in this direction has been in the city of Bombay, where the Government Labour Officer, the Labour Officer of the Millowners' Association and labour officers from individual mills are co-operating in improving working conditions and efficiency and raising the standard of wages.

A still more recent development in the Bombay Province has been the appointment of a Government Labour Welfare Officer and the opening of labour welfare centres by Government in the cities of Ahmedabad and Bombay. This step is a recognition of the principle that the welfare of the worker is not the concern of the employer alone, but of Government as well. The work is wholly extra-mural, being carried on in the various localities in which the workers live.

Welfare Work To-morrow

So much for a very brief account of some of the welfare work that is being done in the Indian textile industry to-day. The remainder of my article will be devoted to welfare work to-morrow, as I discuss a number of ways by which the meaning of welfare can be extended, so that welfare work may be of greater service both to employers and employees.

It was the World War and a growing interest in the application of psychology to industry which gave a new turn to welfare work in the United States. For some time the psychologists had been experimenting with industrial fatigue and endeavouring to discover means of lessening the strain of modern machine industry. They had also devoted attention to the study of labour turnover, with its attendant waste. The World War created a difficult problem in that it placed new demands

on industry and at the same time called experienced workmen out of industry for army service. If efficiency was to be maintained it was essential that the displaced workmen be replaced by men who could operate machines in an intelligent manner. The tool which the psychologists offered was based upon the theory of individual differences. If men did differ in abilities, the task was to discover these differences and to endeavour to place each man in the position in which he could function most efficiently. This new approach to the problem of industrial management was given the name of Personnel Administration and the older welfare activities were designated as a department under this general head, known as service management or employee services. Personnel administration has been described as "labour management enlightened by a scientific spirit and a social conscience." ("Social Work Year Book," 1929, p. 322.) The officer-in-charge of a modern personnel division or industrial relations department is regarded as equal in importance to the executives charged with finance, production or distribution.

The enlargement in scope from the earlier welfare activities to a modern personnel department can be seen from the following description of the functions of such a department:—

- "(a) employment management, which is concerned with the maintenance of the necessary staff of workers, that is, selecting, hiring, transfer, promotion, discharge and the like;
 - (b) training activities;
- (c) health and safety efforts;
- (d) joint negotiation and adjustment, which is concerned with the conduct of collective bargaining or relations with company unions in the determination of terms and conditions of employment and the handling of individual cases requiring adjudication under such agreements; and
- (e) service or welfare work, which is concerned with the administration of the numerous supplementary efforts such as insurance, pensions, savings plans, company housing, lunch rooms, recreational facilities, and the like." ("Social Work Year Book," 1937, p. 340.)

A further study of the kinds of service provided under "(e) service or welfare work" reveals a wide range of effort including medical service and hospitals, indoor and outdoor recreational facilities, libraries, lunch rooms, loan funds, thrift plans, benefit associations, group insurance, provision for sick leave with pay and provision for vacation with pay. Considerable attention is being paid to providing for the security of employees through mutual benefit associations, death benefits, sickness and accident benefits, group life insurance, group health and accident insurance, group unemployment insurance and pensions. There has also been a marked development of employee representation on works councils, shop committees and the like.

As a means toward self-help a large number of Western industrialists encourage systematic savings funds, both with and without company contributions. In some instances the company pays a higher rate of interest than can be secured from the local banks. Employee stock-ownership plans are another form of saving. Profit-sharing plans, about which much was heard in the earlier days, are to-day on the wane.

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Labour unions have tended to be suspicious of welfare work because they believed that it was a substitute on the part of the employers for paying higher wages, and because they believed—and, in many cases, rightly—that it was an attempt on the part of the employers to lessen the influence of the unions. But with the abandonment of the term "welfare" and the integrating of labour relationships into the inner councils of management, much of this prejudice has disappeared. It is now seen that the personnel officer approaches his task, not simply as one content to supply wash-rooms and creches, but as a serious student of labour problems, who endeavours to view the industrial situation in its entirety

Present-day Objective

The present-day objective in industrial relationships is the attempt "to adjust productive capacity to standards of living." The International Industrial Relations Institute has adopted the phrase "optimum productivity" to describe the new objective. By definition, "The optimum of productivity is the best possible achievement, quantitative and qualitative, in output and performance, directed toward the highest standards of living, material and cultural, which are attainable with rational conservation of resources, human and material, and full utilization of the human and technical sciences, invention and skill."

Miss Mary van Kleeck, the Director of the Department of Industrial Studies of the Russell Sage Foundation, points out the implications in this definition when she says:—

- "If the nature of the problem is to achieve such a social administration of technology as shall fully develop its potentialities, then we must recognize three partners in the procedure:
- (1) Industrial management as a science has to administer not only the separately owned units, but the inter-relationships of plants and of industries in an effective producing system.
- (2) Labour unions must similarly function, not only within the workshop, important as is their functioning there, but also on an industry-wide and community-wide basis. Recognizing at once that there are conflicts of interest between labour and management, it must be said that the optimum cannot be completely achieved under present conditions, but that optimum procedure calls for participation of representatives of the unions in the management of production, especially in determining the speed and rate of output. To quote from the paper on optimum productivity presented by Mary L. Fledderus at the 1938 conference of the Industrial Relations Institute at the Hague: 'For the establishment of scientific criteria by management and workers, the contributions of the technical and human sciences are fully needed. Together they can establish these criteria for optimum procedure. For it is this optimum procedure which at any given moment determines what is optimum in workshop productivity.' Moreover, it should be noted that the trade union movement is the only organized group exclusively and directly concerned with maintenance of basic factors in the standards of living, namely, adequate wage rates and reasonable hours of work. The function of the trade unions in the achievement of the optimum is therefore obvious.

(3) Government, though inevitably subject to political pressure from special interests, is not precluded from constructive action, especially through labour laws. The task of Government in establishing good working conditions is to generalize standards achieved by the most progressive managers. This function of generalization is of great importance, and can be discharged by no other agency save that of Government." ("American Labor Legislation Review," June, 1940.)

No one is more aware than myself that conditions in Indian industry—particularly on the side of labour organization—are not such as to warrant an immediate adoption of such a programme. But at the same time we must move with the times. It is absolute folly to place the responsibility for welfare work on the shoulders of department heads, already overburdened with their own responsibilities. It is equally foolish to entrust this responsibility to men, specifically designated for welfare work, but who have had no adequate background of training and who cannot see the problem in its proper perspective No board of directors would place an unqualified man in charge of finance or production But when it comes to the most difficult element in the whole industrial system—the labour element—the cheapest man available is generally regarded as good enough. Ignoring the very aspects which make for efficiency, we bewail our lack of efficiency. To state a problem is not to solve it, but awareness of our shortcomings may in time lead to their correction.

Power Transmission by Flat Belts and "V" Ropes-

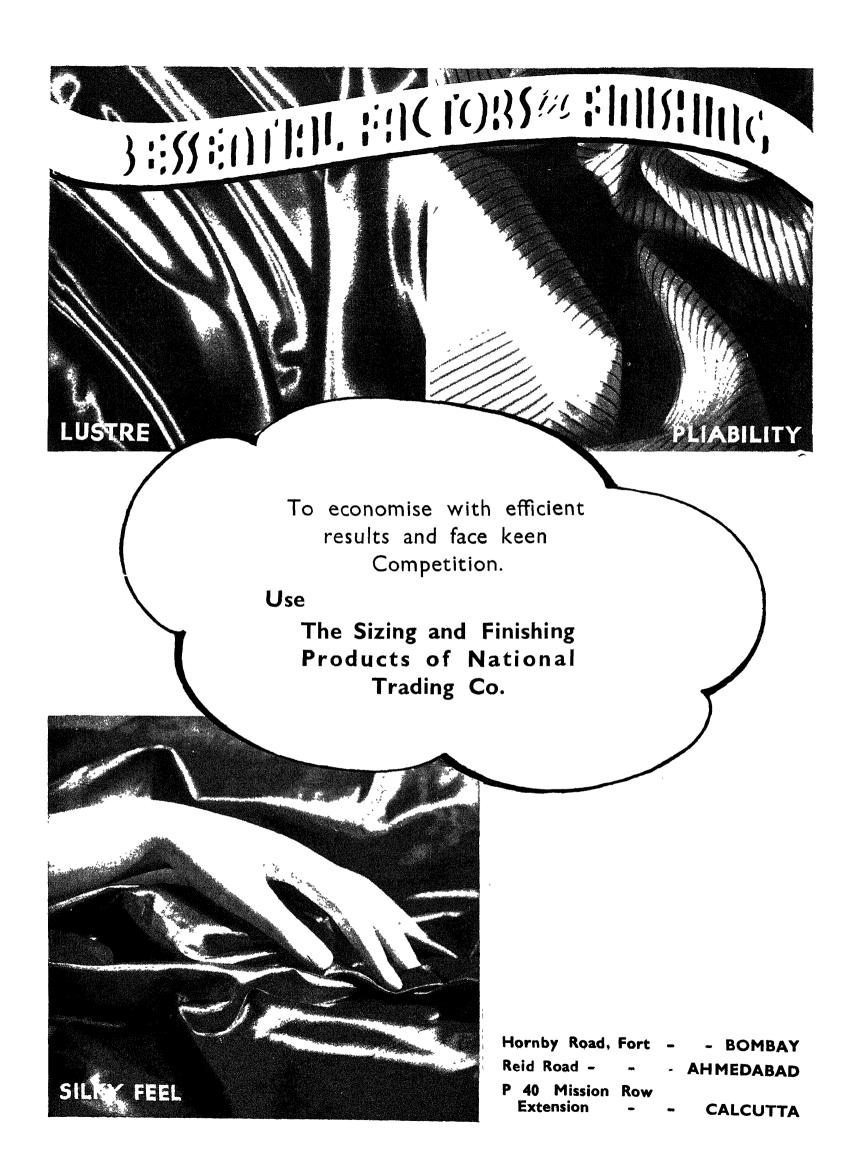
(Concluded from p. 245)

—remember, a $\frac{3}{4}$ in. thick "V" rope—approximately $73\frac{1}{2}$ million times. Against his more frequent replacement costs, the user could set a great saving in space, and the fact that four ropes would carry on after one broke until the most convenient time to effect a temporary shut-down. The ropes had also run constantly without attention.

Particular attention to drive designing should be given when "V" ropes are being installed, and the design for any given set of circumstances can either be worked out by the manufacturer or obtained from one of the standard drive catalogues which most manufacturers issue. If the details are worked out from a standard catalogue, it is necessary to emphasize the importance of bearing in mind the correction factors which are given The standard drives shown in catalogues will not perform satisfactorily on, for instance, textile machinery where starting loads are heavy, and for all such machinery a correction factor of 0 7 must be used. In short, a five-rope drive must be made into a seven-rope drive.

It is essential that pulleys are properly aligned when "V" rope drives are being assembled, and the ropes should be running at a tension sufficient to prevent slippage. If the tension is too slack, the ropes will slip, wear, and power will be lost; if the tension is too high, rope life is decreased and bearing pressures are higher than necessary.

As a general guide, the cost of a complete short centre "V" rope drive (two pulleys and the "V" ropes) can be taken at 10s. per horse-power when motor speeds are at least 950 r.p.m. and speed ratios are not more than 4 to 1. It is impossible to give a straight comparative cost with flat belts and chains, as the fields do not overlap sufficiently for really fair comparisons to be made, but the rapidly accelerating rate of installation proves that "V" rope drives are giving value for money.



Trade Unionism in India—(Continued from p. 47)

the proportion of unrealized assets would rise to 43 per cent

The figures are worth studying also from another point of view. Of the 343 unions which submitted returns during 1938, only 61 had a membership of 1,000 and over and 19 of these exceeded a membership of 5,000. The large majority of the unions are small units with meagre funds, if railway unions and the Ahmedabad Labour Association are left out of the picture.

Why Progress has been Slow

The question may be asked, why has the progress of the movement been so slow? There are, of course, certain difficulties which seem inevitable under the existing social conditions. Illiteracy places the worker under an enormous handicap, whether in his dealings with the employer, the moneylender, the shopkeeper or even the officials of his union. There have come to light incredible "agreements" between employers and workers, possible only because of the latter's complete ignorance of the contents of the documents to which their thumb impressions are affixed.

Another difficulty, which was particularly noticeable in the early days, though it still persists on a fairly wide scale, is that any worker who shows an active interest in the union is dismissed on some pretext or other. The law, of course, was passed in 1926 for the registration of trade unions Nevertheless, several employers adopt an attitude of unbending hostility to even registered unions. Sometimes, this attitude is frank and open. In one instance that I can vividly recall, an employer published a notice calling upon the members to dissolve their registered union or face a lockout. The workers decided to accept his ultimatum and went through the grim ordeal of starvation for seven weeks before the order was withdrawn The Provincial Government refused to intervene, in spite of repeated requests by the union for the application of the Trades Disputes Act. But the local municipality appointed a committee of independent persons who concluded a unanimous report with the following remarks.-

"There remains the most important question of all, the recognition of the union by the authorities. It appears that every member of the Executive Committee had been dismissed within recent months. And, quite frankly, we are convinced that the mill authorities regard the existence of the union with the deepest disapproval. It is registered under the Trades Union Act. It seems to exercise an extraordinary hold on the vast majority of the workers who are its members. There have been industrial disputes in the city in previous years; but none that we can recall in which there has been demonstrated such unity by the workers and such exemplary non-violent conduct as on the present occasion. We have no doubt that the union has created a new consciousness among its members, the effect of which has been to give them a new outlook on life."

But it is not the hostility of the employer alone with which one has to reckon in building up trade unions in India. I have been, in my journeys to industrial areas, accompanied by policemen in plain clothes and formally handed over in a railway compartment from the charge of one policeman to another. The police, especially in the small towns, render the task of an organizer extremely unpleasant and, during periods of political upheaval, even risky.

Apart from such difficulties, the collection of subscriptions is almost always a matter beset with complications. In the first few months after the starting of a union, the workers come forward readily with their contributions—generally an anna or two a month. The overzealous collect them inside the factory or during working hours, and thus provide the vigilant employer with an opportunity for taking disciplinary action. The workers interpret it, naturally from their point of view, as an attack on the union. Outside the factory the task of

collection becomes much more difficult. Few unions can afford to employ a regular staff for this purpose and as a rule, are compelled to leave it to the good sense of the members themselves, or to the members of the executive committee. A considerable proportion of the members evade payment after the first flush of enthusiasm has passed, either because their interest in the union is not active and sustained, or because of fear of action by the employers. It is, unfortunately, also true that even when funds have been collected by the workers or their agents, the full amounts do no in all cases reach the union. The temptation to use up a portion of the collections is sometimes too great for a needy member of the executive.

In exceptional cases, benevolent employers have permitted the collection of subscriptions inside the factory, or even gone to the length of deducting the amounts from the wages of the members and handed over the collection in a lump sum to the officials of the union. But, in general, it may be said that employers do not agree to facilitate this important function of a trade union, nor, on the side of the unions themselves, is there willingness to place themselves in a position of dependence on employers which may become embarrassing during disputes.

The consequence of the low subscriptions and the irregular collections is that it is impossible, except in the case of a few railway unions and the Ahmedabad Labour Association, for an adequate staff to be maintained. The workers, the majority of whom do not earn more than Rs. 20 or Rs. 25 a month in many parts of India, see no reason for paying the clerical staffs of their unions a higher wage than they themselves receive. It is impossible for them to realize that the quality of the work turned out by men on such low wages must inevitably be poor.

An Obstacle

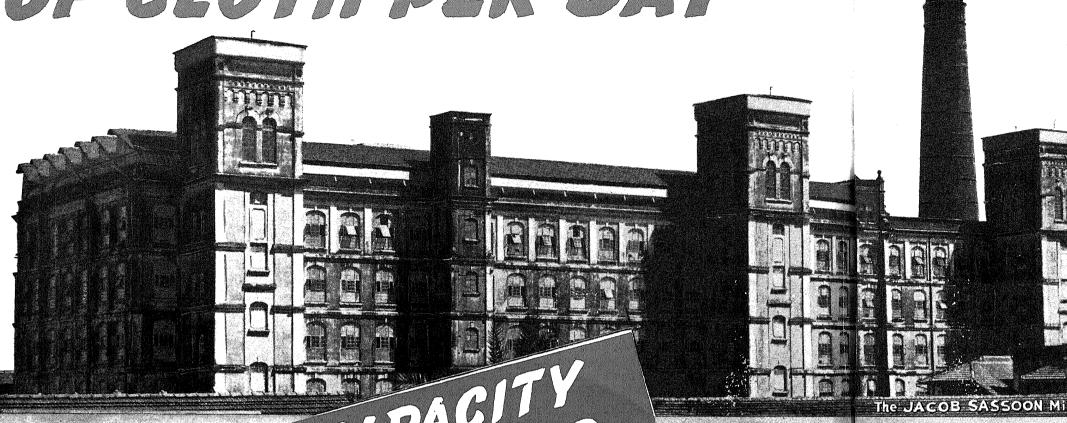
Another obstacle which has been common in my experience is that a worker expects periodically something tangible for his membership—a rise in wages, a shortening of the hours of work or some other amenity which he regards as his due. Failure on the part of the union is attributed, often, to weak or lukewarm leadership. A disgruntled worker whom the union has probably failed to satisfy begins to spread disaffection. A common query is, we have been paying our subscriptions regularly all these months; but what have we got in return?

The fact is that a worker, who is unaccustomed to the rigid standards of discipline in a factory, believes that membership of a union somehow confers on him immunity against any action by the employer. It is not prudent for a union official to suggest that absence without leave or on false pretexts or some serious omission on the part of the worker might justify disciplinary action by the employer. The result is that few unions in the country can afford to sift complaints and take up only such cases as seem prima facie just or genuine. Otherwise, the consequences are likely to be dissatisfaction and even suspicion regarding the integrity of those in charge of the affairs of the union.

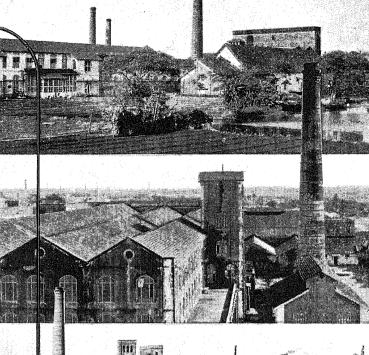
In the face of formidable difficulties, some of which have been described in this article, it cannot be a matter for surprise that trade unionism has made such little headway in India. I have no doubt in my mind that industrial development in this country rests among other factors on a guarantee of enduring industrial peace. If the trade unions have done nothing else, they have at least

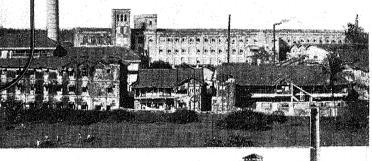
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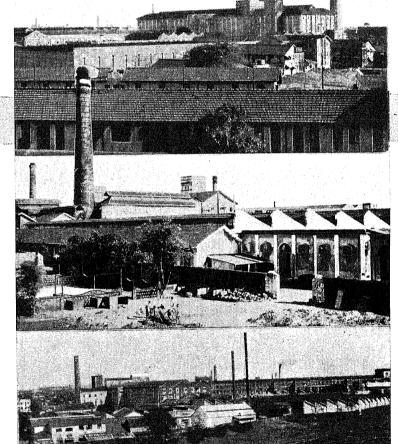
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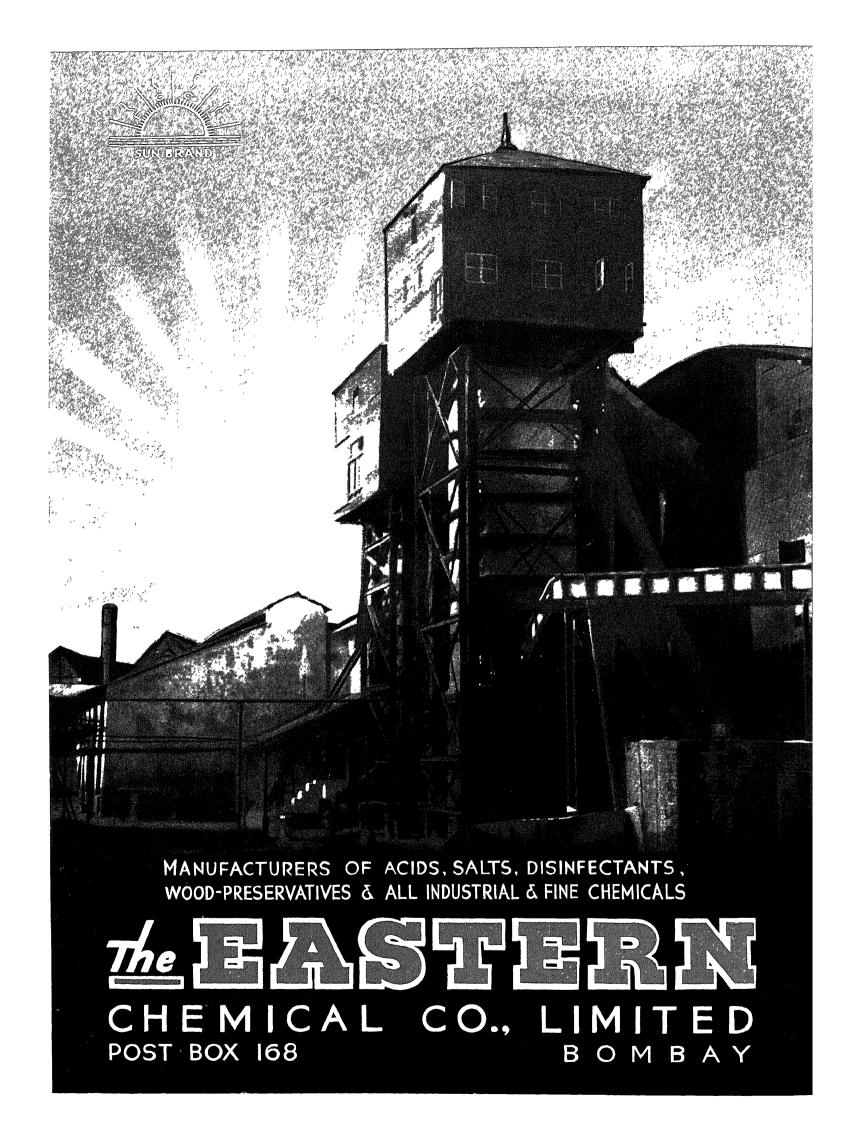
8,96,000 lbs. OF YARN PER DAY

30,000 EMPLOYEES

MANUFACTURERS OF

EVERY DESCRIPTION OF

CLOTH AND YARN



Handloom vs. Powerloom—(Concluded from p. 65) Cess on Mill Products

The fourth suggestion is for a cess on mill products While I am against the imposition of an excise duty on mill cloth I favour the imposition of a cess which, by its very nature, would be a light impost and yet would yield a considerable sum of money Now, there is no doubt that if the handloom weaving industry is to occupy a permanent place in the national economy, it cannot do so on the artificial basis of restrictions placed on competing methods of production. It is necessary that on the one hand public taste should once again turn in favour of hand-woven cloth while on the other hand, costs of production should undergo substantial reduction All this means considerable expenditure on advertisement marketing and technical reorganization. It may be difficult to obtain this money from the general revenues while if we have a cess on mill cloth of the kind suggested above we will get the necessary financial resources for undertaking the positive side of the task of securing the survival of the handloom industry

Reduction of Yarn Duty

The fifth suggestion is for a reduction in the duty on yarn There is no doubt that the bulk of the yarn imported into this country to-day is for consumption by handlooms, and the Report of the Tariff Board (1936) also makes it clear that the imposition of the import duty in 1926 did increase the cost of production of certain types of hand-woven cloth and thus worked to the disadvantage of the handloom weaving industry. It would appear, therefore, that there is a strong case for reducing the import duty on yarn. But I am not in favour of this suggestion. If the handloom weaving industry is to occupy a permanent place in Indian economy it is important that it should obtain its raw materials from domestic sources, and it is not desirable to encourage measures that would ensure its permanent dependence on foreign yarn. In so far as the import duty on yarn helps to encourage the domestic production of yarn, it is desirable to maintain this duty in the larger interests of Indian economy, at the same time, the hardships resulting therefrom for the handloom weaving industry may be mitigated by utilizing the proceeds of the duty to subsidize the domestic production of competing classes of yarn

Fixation of Quota

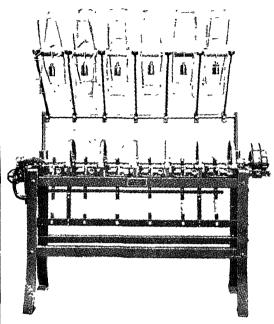
The sixth suggestion is for the fixation of quota and of particular counts between the handloom industry and the mill industry. Thus it has been suggested that mills should be forbidden to weave cloth from yarn of counts below 18, while some would put the prohibition at yarn of counts below 9 But there is no guarantee that this would help the handloom weaving industry in all the Provinces, particularly that in the Bombay Province Moreover, there are a number of types of coarse cloth which are not made by handloom weavers such as drills and jeans, T-cloth and domestics, tent-cloth, etc Further, while the Textile Tariff Board of 1932 expressed the opinion that "the bulk of the handloom production consists of the coarser counts," the Textile Tariff Board of 1936 are of the view that 'under the pressure of competition from the mass production of mills both in India and overseas, the handloom weaver has been forced to turn to the weaving of better quality cloths" There is, therefore, no guarantee at all that prohibiting the mills from weaving cloth of yarn below certain counts will help the handloom weaving industry. This opinion is further strengthened by the fact that there is keen competition between cloths made of different counts of yarn and it is, therefore, not unlikely that any such prohibition as contemplated above may simply lead to a wholesale diversion of demand to the permitted classes of mill cloth I do not think, therefore, that the adoption of this sixth suggestion will result in any effective assistance being given to the handloom weaving industry

To sum up, handloom weaving is an important branch of the Indian textile industry, and it is a truly national industry because it is spread all over the country and gives part-time or whole-time employment to several millions of persons. It is to-day in a distressed condition and one of the contributory causes of such distress is the competition of mill cloth. It becomes necessary therefore to resolve this conflict and accordingly regulate the mutual relations of handlooms and mills The Government of India is placing this guestion on the agenda of the next Provincial Industries Conference and has circulated for opinion a list of six suggestions it has received for resolving the conflicting claims of handlooms and mills Of these six suggestions, four are rejected by me, one is accepted and the other is commended for serious consideration The suggestion which is accepted is for the imposition of a cess on mill products, this suggestion is accepted on three conditions, viz, that it applies also to imported cloth, that it applies to mill cloth equally in all Provinces and in Indian States and that its proceeds are made to constitute a fund to be known as the Indian Handloom Weaving Maintenance Fund which will be used for the promotion of the interests of handloom weaving In particular, this fund should be utilized to advertise handloom products to help in their marketing and to finance research and aid in the improvement of the technique of handloom production. The other suggestion which I would commend to the serious attention of Government is the restriction of mill output by prohibiting mills from increasing their production of saris and khans. This suggestion is subject to three safeguards viz that it will apply to imports and that it will apply equally to mills in British India and in Indian States, the third safeguard is that the existing output of mill sans and khans should not be interfered with, restriction being confined merely to preventing any increase in this output I believe that if these two things are done, viz, future increase in the existing volume of output of mill sans and khans is forbidden and a small cess is imposed on mill products for building up a special Indian Handloom Weaving Maintenance Fund, then much will have been done to relieve the handloom weaving industry of its existing distress and the path would also be clear for ensuring its permanent and useful retention in the national economy

Trade Unionism in India—(Concluded from p. 251)

created a definite class consciousness among the workers sometimes asserted with disconcerting vigour The scandalous conditions described by the Industrial Commission in 1917, in a paragraph quoted earlier in this article, remain substantially the same to-day Legislation alone will not put them right. There must be, in this country, a series of voluntary agreements between employers' and workers' organizations, breaches of which would be regarded as seriously by the members concerned as any violations of a law But such agreements would be possible only when the right of the workers to organize themselves is conceded freely and without any reservations. That stage has not yet been reached in India, and in some big industrial centres like Cawnpore seems far off Employers in India must realize that revolutionary tendencies are born out of despair

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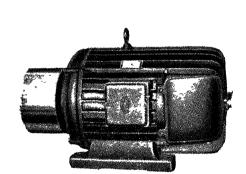
TAPE LOOMS

BRAIDING MACHINES

WINDERS



DAYTON DRIVES



MOTORS

MOTORS, GENERATORS

MAGNOLIA METALS

STEAM TRAPS

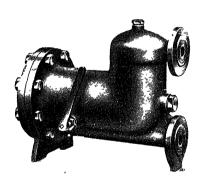
GEARING

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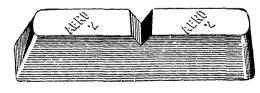
FIRE PUMPS

MACHINE TOOLS & INDUSTRIAL MACHINERY

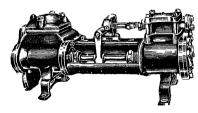


DAYTON V-COG BELTS

STEAM TRAPS



MAGNOLIA METALS



STEAM PUMPS

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Railway Rates—(Continued from p. 117)

all systems. This results in numerous anomalies, such as¹³:—

Per Md

							Rs	a	p.
From Surat	to Calcutta		Cotto	n, 1,155	mile	es at	2	2	-8
	Cawnpore		11	825	,,	,,	2	7	2
Bulsar	Calcutta			1,192	11	11	2	4	8
	, Cawnpore		11	1,192	11	11	2	9	5
Bomba				840			2	3	9
Cawnp			11	840	11	11	1	10	11
, Cawnp	ore it porring	• •	,,,	040	11	11	•••	10	11

Piecegoods, the value of which is more than twice that of raw cotton, are carried 663 miles from Cawnpore to Howrah at the rate of Re. 1-1-0 per maund; while cotton from Khandwa to Cawnpore for approximately the same distance at more than twice the rate, viz., Rs. 2-4-9. It is true that some allowance must be made for the transfer of traffic from one administration to another, the break of gauge and transhipment. But the cases that have been cited are too glaringly anomalous to be thus explained In fact, even the Wedgwood Committee added that the criticism applies most strongly in the case of exchange of traffic from one State-managed system to another, and will increase in force if more systems are transferred from private to State-management.14

Piecegoods

The Method of Inquiry.—When we pass on to piecegoods, we shall be obliged to follow a slightly different method of study, especially because any detailed comparisons arising out of the variety of goods and the minute description of commodities would carry us far beyond our present purpose. Again, we would also lay emphasis on other aspects of the problem rather than merely underline our argument in the foregoing paragraphs.

We have already seen the increasing quantity of cotton that is now consumed by the textile mills. Though the output of the mills has substantially increased and there has also, in consequence, been an appreciable rise in the tonnage carried by the railways, the earnings have not shown appreciable advance. In 1926-27 the tonnage carried was 582,000 and earnings were Rs. 2,46,38,000, whereas in 1937-38 the tonnage was 713,000 and earnings Rs. 2,60,61,000. This result is, as we shall presently see, interesting. It is due in the first place to the loss of long haul in imported traffic and in more substantial measure to the rapid increase in the number of mills in the mofussil areas. We have called the result interesting because here is an example of an industry that has not been favoured by the railways yielding results similar to those in another industry which has admittedly been assisted by the railways in the matter of freight rates, viz., iron and steel.15

¹⁴ Report, para 128.

15			
		1924-25	1936-37
Tonnage	••	851,000	1,399,000
Earnings Rs.		1,83,10,000	2,49,16,000

These figures include the additional traffic in raw materials, see Sir Guthrie Russell's article in *Times Trade and Engineering*, April

Motor Transport and Special Rates

There is a further important factor that accounts for this result, viz., motor-transport. During the period of the prosperity of the railways (1924-30), motor transport was in its infancy but now the railways have to face severe competition when motor-lorries haul goods traffic for 800 to 1,000 miles. It is very often argued by the railway authorities—when it is pointed out that the rate-structure has been manipulated with a view to fostering trade with the ports—that this is not deliberately done, that these ports happen to be the chief industrial centres. 16 Here at least will it be admitted that the policy, in fact, has not succeeded when we bear in mind the almost phenomenal progress of the cotton textile industry.

All this does not mean that no special (station-tostation) rates ought to be charged. Rather they might advisedly have been, and the railways might have increasingly been responsive to the needs of the industry at any rate in their enlightened self-interest. 17 In fact, the Bombay Millowners' Association had represented even to the first (1927) Textile Tariff Board that the railways might even discriminate between the indigenous manufactures and imported products in the matter of freight rates. The Board dismissed the suggestion on the plea that difficulties in the way of applying it to the cotton textile industry appeared insuperable. 18

Our plea, however, is a much more modest one and is based on much less controversial ground. With the coming of motor transport, railways in other countries have been obliged to adopt measures 19 hitherto unknown to them, such as increased number of special tariffs and at the same time unification of the tariff system and extension of special tariffs to many lines of traffic.

Recent Enhancements

We must, however, first complete the story of these railway rates. From 1st May 1936 the G. I. P. Railway increased the number of classes from 10 to 16 with a view to securing a more convenient allotment of commodities to their respective classes. These new classes were inserted between the old classes 2 and 3; also two new classes between the old 4 and 5 and a new one between the old 6 and 7. Thus piecegoods which belonged to class 4 (with the rate .62 pie per maund per mile) are now to be classed as 4B (with the rate ·72 pie). This means that along with four other commodities piecegoods will bear an additional charge of five pies per 100 miles, an increase of 8 per cent. It is true that the G. I. P. had no immediate intention of increasing the reduced station-to-station rates. It was, it asserted, only endeavouring to improve its financial condition.20

Finally, mention must also be made of the recent raising of rates and fares by the Government of India from 1st March 1940. The rates have been enhanced by 2 annas in the rupee on all consignments of goods traffic, excluding coal, coke, patent fuel, military traffic and a

¹³ These figures are taken from those quoted by Mr. A. C. Dutt and Mr. Gavin Jones in the Legislative Assembly (22-2-1938). Mr. Dutt, quoting the last rate, added that it destroyed the whole basis of the rating structure.

It may be added that as against these examples the special rates given to the sugar industry have brought appreciable increase in earnings.

^{16&}quot; Practically all these rates have been influenced by the fact that the ports are the chief distributing centres and incidentally also the more important industrial centres." Railway Conference Association Bulletin No. 1, 1938.

¹⁷ The case of the sugar industry has already been cited.
18 Paras 196-197.
19 Cf. "Road and Rail in 40 Countries," p. 300, et seq. Such measures in different countries have also been described by Dr. Z. Ahmed in his "Indian Railways," p. 195-207. In certain countries special rates are applied to 70 per cent. of their total traffic ton-kilometres.

 $^{^{20}}$ Cj. Letter addressed to the Indian Merchants' Chamber, Bombay, on 6-11-1936. Report of the Chamber for 1936, p. 200

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few other commodities. The main object of this general increase is to help the finances of the country and afford relief to the tax-payer.

Conclusion

We have thus examined a few of the leading features of the railway rates with reference to the cotton industry; their individualistic policy (even in the case of Statemanaged lines), their extreme conservatism if not indifference to their own growth and progress; their scant regard for the demands of the industries; and the extreme latitude given to the railway authorities21 to meet their peculiar requirements, for if the rate charged is between the maximum and the minimum prescribed by Government, the latter would not interfere. It is indeed a grievous commentary on the railway rates structure that Indian cotton growers have to depend so much upon foreign demand that Japan could brandish a bludgeon (in the form of a boycott) and extract favourable terms as she did in 1933. It is a still more dismal reflection that cotton mills at Ahmedabad or Nagpur have to pay comparatively higher freight per mile for the Punjab-American and would rather import foreign cotton through Bombay at lower rates; and this same cotton can be conveniently exported by Japanese exporters at reduced rates obtainable from the cottongrowing tracts of the Punjab to Karachi port. In the foregoing paragraphs, therefore, we have desired to emphasize the need for an impartial (and even expert) body to investigate and adjudicate upon such complaints as come from the trading community against the railway authorities.²² It will be of interest to note that the charge is repeated by even "outside" students of the subject.23 There is a further general plea that may also be made. Apart from the enormous stake the Government have in the railways in India, or even the nature of the enterprise, the kind of monopoly and the service of the public utility concern, State control and supervision in respect of railway rates are inherent in the very nature of rail-road administration. There can be no justification for a State-managed railway adopting a policy which results in injury to public interests and fails to minister to the legitimate aspirations of the people whom it seeks to serve.24

There must be something fundamentally wrong when the demand for an impartial Railway Rates Tribunal that has been made by all the important Committees and Commissions that had anything to do with the railways (directly or indirectly) has not been met. The compromise measure which the Government have hitherto adopted, viz., the Railway Rates Advisory Committee has—by its constitution, procedure and functions—only served to strengthen the case for such a full fledged tribunal. Even the Federal Railway Authority contemplated under the Government of India Act of 1935 is not calculated to inspire confidence in respect of the railway rates policy.

21 It is of interest to note that under the new conditions of the Government of India Act of 1935, the Wedgwood Committee would like that the Government should limit its interest to that of a debenture holder;

the Government should limit to see para 216

22 Various unsuccessful efforts have been made from time to time by men like the late Sir V. Thackersey, the late Sir D. E. Wacha and Sir I. Rahimtoola and Sir P. Thakurdas to secure the appointment of

Sir I. Rahimtoola and Sir P. Thakurdas to secure the appointment of such a committee.

23 E.g., Daniel Buchanan, writing about cheaper rates from ports.

"The only ground of complaint is upon the assumption, which is quite natural, that Indian manufactures had a right to favour from the national railways. This in any systematic way they have surely not received."

"Development of Capitalist Enterprise in India" p. 186 (Columbia).

24 Cf Speaking about such State control, Dr. N. B. Mehta aptly observes, "It may also be possible thereby to bring the public and the railways into more harmonious relations and dispel mutual apprehensions," Indian Railways, p. vi.

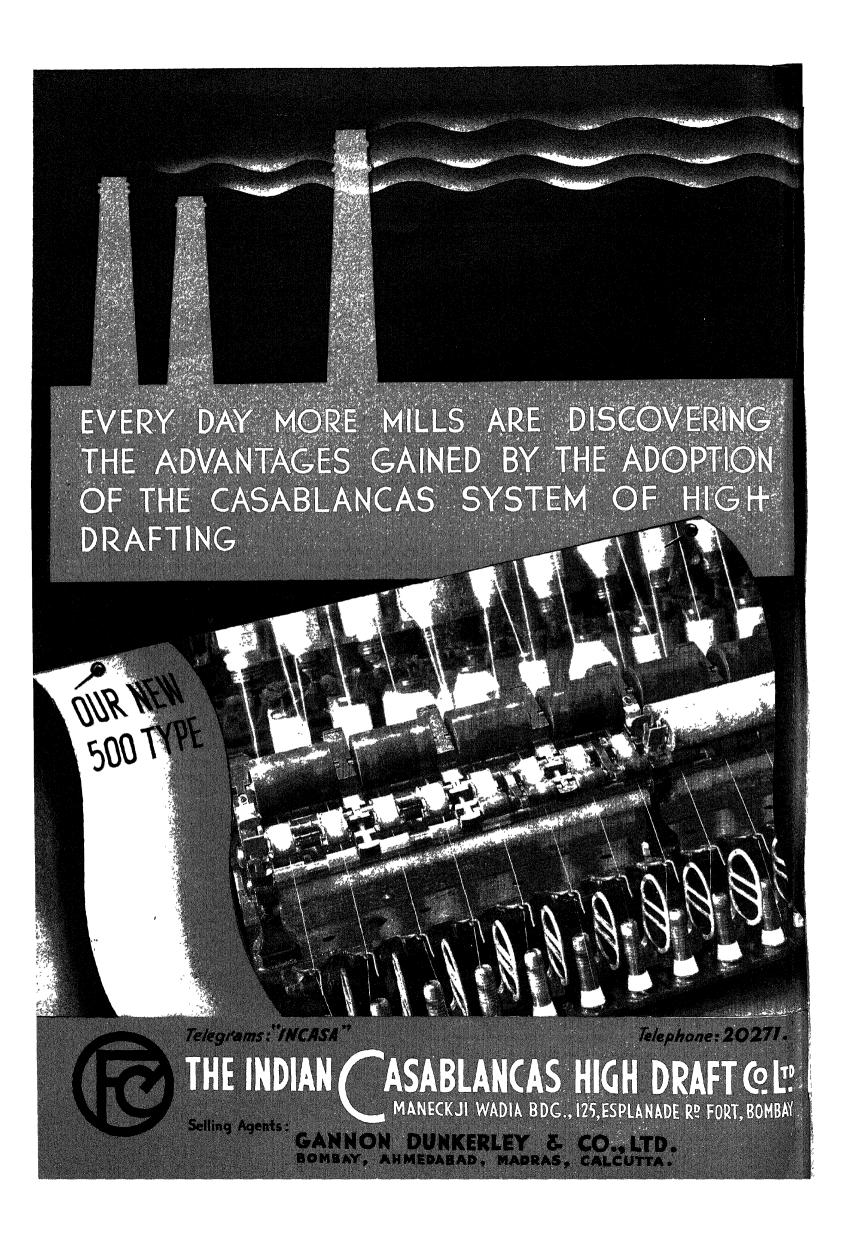
Developments in Preliminary Processes of Weaving-

(Concluded from p. 127)

were required on the part of a warper, but now, owing to the vast improvements in the construction and mechanism of the machine, a comparatively unskilled workman without much practice can manage it. Formerly double-flanged bobbins were placed horizontally in the creel where they rotated on the creel pegs while the yarn was withdrawn by a pull from the side At first there were no flywheels to the machine and the consequence was the overrunning of the bobbins with a smash when the machine was suddenly stopped. With the introduction of the flywheel, however, this difficulty was overcome and the machine came to a gradual and steady stoppage. This, however, led to another drawback in the losing of the broken end on the beam. A new contrivance was further added, viz., that of falling rods which held the slack ends from the overrunning bobbins in a straight position when the machine came to a gradual standstill. This mechanism is also useful in finding the lost end on the beam by turning it back. Even then, the warper was required to be very careful for watching a broken end, but Singleton's mechanism relieved him of his cares by introducing the drop pin arrangement by which the machine automatically stops when a single end breaks Another thing for which a warper was held responsible was the accurate length of yarn wound on a beam. There was a dial which indicated the number of yards run by the yarn but there was no arrangement for automatically stopping it at exactly the required length and the beam would overrun a few yards if the warper was not careful to stop the machine in time. The length overrun had to be wasted when the other beams of the sets were finished on the sizing machine This was overcome by the invention of Hutchinson who contrived to stop the machine automatically when the beam had run the required length.

For various reasons, however, the tension of the yarn on double-flanged bobbins remained unequal, resulting in forming a beam the density of which was not uniform. Experience is that such beams when withdrawn on the sizing machine prove a source of constant trouble with slack ends. The machinists were, therefore, thinking of developing a machine which would obviate this trouble. But it was not till the end of the last war that a new mechanism was successfully brought on the market, the main feature of which was a creel which admitted cones in place of the double-flanged bobbins with a delivery from overend. The advantage of this arrangement was the absence of a drag or pull on the yarn which sometimes resulted in overstraining it. The overrunning of bobbins was out of the question in this system. Some means had, however, to be devised to control the tension and to avoid slack ends on the beam and much ingenuity is applied in making the arrangement perfect, avoiding not only the unequal tension but also preventing the yarn from ballooning. Each end was separately put under the tension of a revolving disk which has the advantage of cleansing the yarn without being clogged with dirt. The absence of drag on the yarn enabled the machinists to increase the speed of the machine upto 500 yards per minute as against 75 yards with an ordinary machine.

Later on, magazine creels were added which enabled the warper to run his machine continuously without stopping for creeling. While one set of cones was working he could manage to creel another set and to tie the bottom ends of the working cones to the nose ends of those of the other set. Thus when the working



cone is empty the fresh one begins to get withdrawn automatically

Sizing

As for the last operation in the preliminary process of weaving, i.e., sizing, it must be said that very little improvement had been possible in the machine excepting the introduction of a new type called a Hot Air Sizing Machine. A few minor changes can be said to have been effected in the cylinder drying machine. On the other hand, a large amount of investigation and research has been applied to the various ingredients of a size mixing and also the way in which the mixing is prepared

Some of the objectionable features mentioned against the cylinder drying machine are as follows:—

- (1) The contact of the wet sized yarn with the hot cylinder destroys the roundness and flattens it out
- (2) If on some occasions the machine is stopped in mid-working, the portion of yarn in contact with the hot cylinder is likely to be scorched
- (3) The two cylinders are required to be driven by the sheet of the wet sized yarn which is more or less strained.
- (4) The feel of the sized yarn is comparatively harsh.
- (5) Due to the condensation of steam in, and the radiation of the heat from, the cylinders, the consumption of steam is higher than in the case of the hot air sizing machine

As for the first objectionable feature, i.e., of the flattening of the sized yarn, it has not yet been definitely proved under exactly similar conditions and no authoritative and unqualified verdict has yet been given in this case. Little difference is seen in the cloth sized by the two different methods.

As for the other objectionable features, attempts have been made to remedy them as far as possible. We can now have a contrivance applied to the sizing machine which automatically stops the supply of steam to the cylinders when a machine is suddenly stopped. Another arrangement that is invariably found with new sizing machines is the slow speed motion which reduces the scorching of the yarn. For working fine counts on the ordinary sizing machines without the strain of driving the cylinders, the machinists have devised a mechanism for a positive cylinder drive. The ball bearing arrangement, on which the drying cylinders are now made to run, greatly helps in reducing the strain on the yarn.

One of the most important operations of the Tape Sizing Machine is the proper circulation of size. Another important item is the maintenance of steady temperature in the sow-box which is rather a difficult job to be accomplished. Along with this a constant level of size in the sow-box is to be maintained. Things, however, are made easy if the machine is supplied with the latest improvements. As for the first two points, certain mechanical methods are definitely getting into favour with the sizers. The only precaution to be taken is to see that a real temperature control is obtained.

The way in which the liquid size is prepared with different proportions of the ingredients had been looked upon as a great secret in England and is yet taken to be so in India. Every sizer imagines that the size he uses is exclusively his own and best suited to his purpose. He never allows it to be made known to others or to get it investigated systematically from a scientific point of view. The result is that many ingredients are claimed to have properties they hardly possess. During

the period under consideration, however, scientists have extended their researches to the various materials used in sizing and we have now at our disposal the results of their investigation with almost a complete knowledge of their properties.

The three different mixings that are in common use are (1) Pure, (2) Medium and (3) Heavy. The quantities and proportions used in each of these will necessarily have considerable variation. To all of them, however, one substance will be common, 1 e., a good adhesive.

Formerly, this was prepared by keeping wheat flour in a fermented state for a long time, the longest period being even six months. It was imagined that this long period of fermentation was the source of a mellow feel to the cloth which could not be obtained by any other method After some experience and investigation it was revealed that this method of fermentation is the chief cause of developing mildew in the case of goods exported to warm countries. The use of zinc chloride as an antiseptic to the formation of mildew was then recommended Bean and Scaristrich who made long researches in this connection arrived at the conclusion that the addition of antiseptic to the water in which the flour was steeped prevented the formation of mildew in the beck and also shortened the period of steeping to two to three weeks Another advantage claimed for this method is the preservation of Gluten which has a good adhesive property. The quantity of zinc chloride that the authors recommend is 8 to 10 per cent of the starchy matter in the case of heavy size and about 3 to 5 per cent. in the case of light size.

Many other starches came into use during the last fifty years. These are Farina, Maize starch, Sago, etc. Some of them were in use before but not in so pure a quality. Specially German Farina was looked upon as one of the best adhesives for pure and medium mixings. With the addition of a little quantity of caustic soda Farina was prevented from getting liquid even after some standing. Sago is also at present used mainly for pure size and at times mixed with wheat flour for a heavy size. If steeped in water overnight and sufficiently boiled for complete gelatinization the harsh feel of the yarn is much modified.

During the last twenty-five years scientists have succeeded in turning by chemical process ordinary starches into soluble ones which are boiled thin and yet maintain a good adhesive property. Many such starches from Western countries, but chiefly from America, are now available in the market. They are most important for pure size.

As for softening material, pure tallow still rules supreme though many substances are offered as alternatives. The only thing that is used in addition to tallow for increasing the softening property is pure soap. As for antiseptics, though many substances are tried only salicylic acid has stood the test. Until recently a German product named Aktivin S was also available. All these are used in pure size.

In the last preliminary process of weaving there is hardly any improvement so for as Indian mills are concerned. In some Western countries, specially in America, the machine for automatically drawing in the ends in the heald and reed is generally in use. But in India, owing to the complexity of the machine, it is not preferred to the old simple system of hand-drawing Only one or two mills are reported to have used them successfully. We have very few standard sorts which run continuously throughout the year, and this limits the use of an automatic machine in this country.

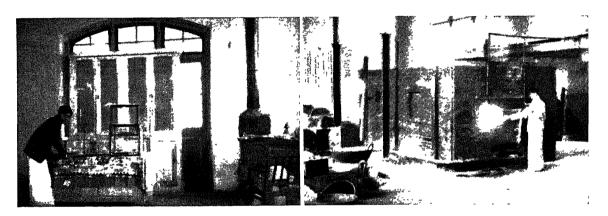
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For fullest details, consult Dr. V. R. Heeramaneck, B.Sc. (Hons.), M.Sc., Ph.D. (Bom.), A.I.C. (London), Proprietor, Windsor Industrial Corporation.

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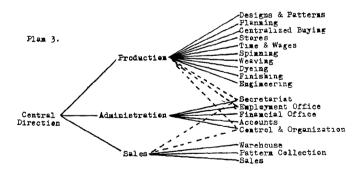
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Principles of Organization—(Continued from p. 107)

to the point where the action originates." The higher executives have to lay down the policy and, under certain circumstances, the line of interpretation. The day-to-day administration, etc., is left entirely in the care of departmental heads. They must have clearly defined responsibilities and, consequently, powers, so that no overlapping can take place. The neglect of this point often leads to friction. The degree of this delegation of responsibility, the limits to which the functional heads and their subordinates may go in the exercise of their authorities, what they may or may not do, depends entirely on the ability and trustworthiness of the people concerned. The choice of suitable men, from the technical as well as administrative points of view, is the care of the highest executives and it is entirely in their interests to find men who can be trusted to make sound decisions. The system where the big boss had to decide every detail and the rest of the people were merely "rubber stamps" was discarded by all progressive institutions long ago. There are hordes of other duties for the highest executive to perform—and they are also to be demarcated in the organization plan-without his having to be burdened down, for example, with comparatively minor details of production. According to Printice Mulford, the best executive is the man who has sufficient peace of mind to absorb and ponder over all the new ideas and suggestions that are continuously pouring in on him.

With the delegated responsibilities naturally go liabilities, and controlling machinery has to be created to see that these liabilities are fulfilled. Several books have been written on the subject of methods of control, and ingenious and painstaking methods have been evolved for making it effective. Generally speaking, every single element constituting the business and exercising an influence over it has to be controlled, starting from the purchase of the raw material to the sale of the finished product.

An examination of Plan 3 will show that specialization has been carried another step forward and there has been some regrouping of departments. Among the



new "functions," two of them, planning (of production) and administration, are the most interesting. Planning of production implies the power of visualizing the whole process of production in all its details. The programme of production is drawn up by this department and the production departments have to follow it to the letter. There are to be no wasteful stoppages or delays on any account; all materials, raw, partly finished and subsidiaries, as well as the tools, machines, workers and everything else that may be necessary for the production of the article have to be on the right spot at the right moment. Of course, if there is only one article being produced day in and day out then there is need only for an initial production programme but not of a permanent planning department. This is, however, an ideal which we can approach but can never attain; there must be

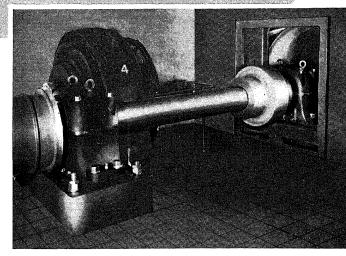
variations in the products of all manufacturing concerns, only the degree of variation will differ from case to case and it might be remarked that it should be the care of all concerned to minimize these variations to the greatest possible extent. The necessity of careful planning is all the more evident in the textile industry because here all the processes are successively arranged and a disturbance anywhere in the line has its effect on the subsequent processes and, under certain circumstances, on the preceding ones as well. This invariably leads to men and machines being idle. An accumulation of stock in any form naturally means a loss in the shape of interest charges accumulating on these stocks. The capital value of the stock increases as it nears completion and, consequently, the interest charges will be higher if finished or semi-finished products are kept in stock. It follows that the greatest amount of co-ordination between sales and production is necessary. Planning, as the science of management understands it, has become as essential for the modern industry as the machines of production. Even a superficial survey of all the causes of machine stoppages will show that a surprising number of them were due to ill-balanced productions, that is to say, due to avoidable causes. For an industry where wages and "burden," that is, the purely manufacturing costs are relatively high, it is considered an unpardonable sin to let the machines stand idle. In the textile industry the material costs predominate but under no circumstances should it be permitted, even in this case, to regard the idleness of machines with equanimity. If circumstances do not justify the creation of a separate planning department, or even a single whole-time post, then this function can at least be combined with another suitable one and entrusted to a single person. It is worth the trouble and, with a proper knowledge of all the processes involved and the technique of production planning, it is a fairly simple matter to evolve efficient programmes and controls.

The purpose of administration is more or less explained by the plan but it would be well to understand that it is not an isolated, co-ordinated function but more a co-ordinating force over all the other functions. With a staff and line organization as sketched out above, the division of responsibility is a necessary affair and with the division of responsibility the need for coordination between the separate departments is imperative. It is the administrator's most important duty to bring about the necessary co-ordination between the different departments. He is a sort of a liaison officer and it is for him to create means and methods to attain this object regularly and continuously. Some of the problems that are always arising result from the need of co-ordination between production and sale, the control of stock and supply movements, and the control of production and finance. There may be a financial budget for each department to conform to and there certainly is a production programme drawn up under the supervision of the administration and in consultation with the departments concerned as well as the sales department that must be strictly carried out.

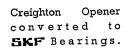
In conclusion, it might be remarked that these principles are nothing new. Individually and as an author puts it, as "management text" they are fairly common knowledge, but when Harry Arthur Hopf remarks ("Management and the Optimum"; 6th International Congress for Scientific Management, London, 1935) that the "study of the organization structures of hundreds and hundreds of business enterprises, both in America and abroad, has convinced the author that

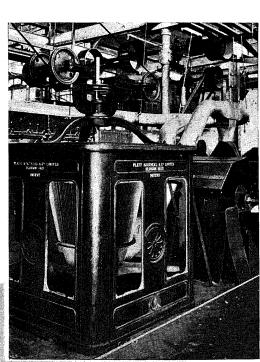
and the Indian Entire Industry

The photographs on these pages illustrate some typical examples of 5KF bearing applications in India's Textile Industry. More and more mill managers realise the advantage of quality antifriction bearings various machinery and on lineshafts. Power bills are smaller, cost of lubrication and maintenance are reduced, and break-downs are avoided when 5KF bearings are introduced.



A main turbine drive transmitting 4500 H.P. at 214 r.p.m. in ajute mill equipped with SKP Self-aligning Roller Bearing Plummer Blocks for 13' shaft diameter.



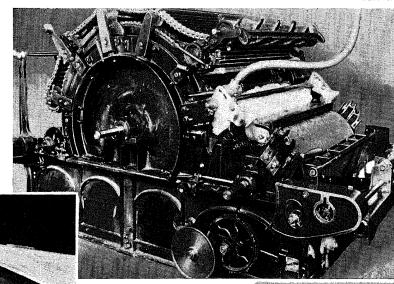


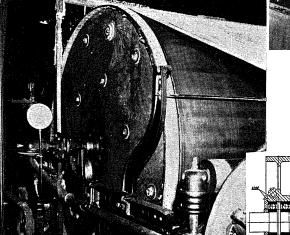
More than 150 mills in India have their line-shafts equipped with **SKF** Ball and Roller Bearing Plummer Blocks, Couplings, and Pulleys. This photograph shows an **SKF** equipped Weaving Shed.

These Beater machines are all converted to **SKF** Bearings.

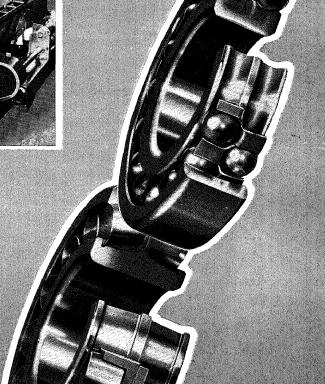
An **SKF** application to a Carding Machine.

The supporting rollers for the Cylinders in this Sizing Machine are **SKF** equipped.









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SKF BALL BEARING COMPANY, LIMITED

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Principles of Organization—(Concluded from p. 263)

in many instances they reflect the forces of personality and power rather than the logic and strength of proper structural relationships," then it can only be concluded that people either do not think it worthwhile or have not the necessary patience to get to grips with the problem, although, according to Hopf, "the ultimate arrival of such enterprises at a plateau of progress from which emergence often follows a downward rather than an upward curve" is due to the already mentioned lack of conscious organization.

Non-Textile Uses for Indian Cottons—(Concluded from p. 77)

motor cars were registered in the U.S.A. alone, we can picture to ourselves the huge quantities of cotton that have been consumed in this industry. It is well known that a scheme for the manufacture of motor cars in India has been under consideration for some time past. The Indian requirements of motor cars are very much smaller than those of the U.S.A., but even allowing for this fact, when this new industry comes into existence, it will certainly help in consuming some of India's surplus cotton. Similarly, the aviation industry in other countries consumes fairly large quantities of cotton. This is used not only for the manufacture of a large number of articles which are required for the engine and the body of the aeroplane or for the manufacture of the parachutes which are carried by all aeroplanes but also in the construction of the airport runways. On account of her large distances and open spaces, India is eminently suited for travel by air. It is, therefore, a matter of time before this industry is developed in India on a scale compatible with its size, and when it happens it is certain that it will consume fairly large quantities of our cotton Another very promising outlet for our surplus cottons is the use of fabrics in the construction of roads. Experiments which have been carried out in the U.S.A. have shown that if, in the construction of asphalt roads, an open weave fabric is used, the road lasts much better and longer, and the cracks are fewer as compared with the ordinary road. These experiments have given such satisfactory results that upto 1938, 600 miles of road had already been constructed in the U.S.A. with cotton fabrics while provision had been made for the construction of another 400 miles. Similarly, cotton mats have been found very useful in curing the cement roads, especially in regions where water had to be transported from long distances. The manufacture of these mats consumes fairly large quantities of cotton and cotton waste. The Indian Central Cotton Committee has decided to undertake, with the co-operation of the Bombay Municipality, similar experiments to find out whether such roads would stand the climatic conditions prevailing in Bombay, and, if the results of these experiments are satisfactory, they would open out a great possibility for the use of fairly large quantities of cotton, especially the short-staple types from which fabrics required for this purpose are usually made.

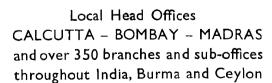
The U.S.A. is fortunate in this respect in being able to focus its attention on one crop without prejudice to any of her other crops. In our country the problem is complicated by the fact that we not only grow a huge crop of cotton, but we also grow large quantities of other fibres which are being, or can be used for some of the purposes enumerated above. Thus, in the U.S.A.

successful attempts have been made in preparing cotton cloth for covering cotton bales, and in the last season a large number of bales of American cotton imported into this country were covered with such material. If we in India made similar attempts to cover our cotton bales with cloth made from cotton, it may help in the consumption of a fairly large quantity of cotton, but it would be at the expense of one of our own crops, namely, jute, from which hessian is manufactured at present. We may thus solve, to some extent at least, the problem of one crop, but we shall at the same time create a new problem for another Indian crop. Similar considerations apply to the use of cotton in roof and wall materials, for houses and other structures, bags for cement and sugar, etc. We have to proceed carefully, and prepare our programme in such a manner that, while the interests of one commodity may profit, those of another Indian commodity may not suffer. In this work a good deal of fundamental research work supplemented by developmental research with the aid of the State and the co-operation of the industries concerned is necessary. We have before us, as a beacon-light, the example of the U.S.A., where such research has opened up many new channels of consumption which are being explored vigorously to assess their potentialities of consuming surplus cottons. We should not only profit by their experience, but, taking full cognizance of our peculiar conditions and requirements, should try to explore all possible avenues for the utmost possible domestic consumption of the cotton crop of India.



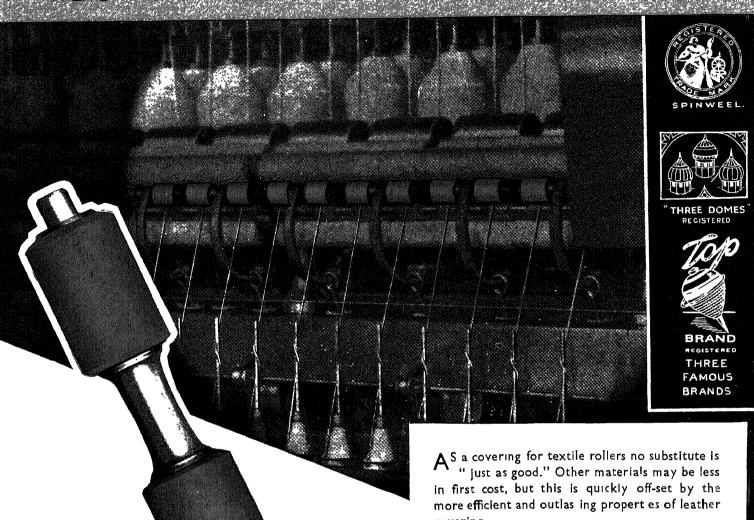
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Progress in Cotton Spinning—(Continued from p 123)

the trade about the year 1828, but a short experience soon revealed the fact that it was not an improvement. The Glasgow or Montgomery Patent Throstle was, like the Danford, of American origin though considerably improved by Mr. Robert Montgomery, who patented it Great expectations were entertained of this invention for some time, but they were destined to remain unfulfilled.

Many other inventors attempted improvements on this machine, but with little success until Messrs Shaw and Cottam of Manchester in 1848 introduced the idea of driving the spindles by means of two tin rollers in the place of one. This superseded "tape" driving.

Ring Frame

The Ring Frame was first heard of from the United States of America. The Danforth Throstle Frame having proved a failure, the ring frame appeared immediately afterwards, but its success was prejudiced by the failure of the throstle frame. Its scientific merits, however, prevented it from passing into oblivion. Efforts were made to improve it. It appears to have been invented about the year 1833 by Mr. Jencks, of Pawtucket, Rhode Island, and it is known that in the year 1845, the firm of Fales and Jencks took up the manufacture of a serviceable ring frame after Alvin Jencks had made many improvements on it. The ring frame did not win public favour in England on its introduction owing to many practical difficulties which could not be overcome The consequence was that its use was abandoned in England and for many years its existence was almost forgotten. It was reintroduced by Mr. Samuel Brooks, machine maker of West Gorton, Manchester, who sent his representative to the United States who brought back with him specimens of spindles, rings and cops of yarn and everything necessary to illustrate his statements and to enable him to give full details of the construction of the frames. Many costly experiments to perfect the ring frame were carried out because, though much had been done in the States towards making the ring spinning Frame a thoroughly good machine, yet when it was brought into competition with the highly developed mule of England, it was found that much remained to be done before it could be said to equal, much less surpass, it. For five years not much success attended Brook's efforts in this direction. The difficulties encountered were chiefly in connection with the construction of the spindle. In the spindle of the first spinning frame, the neck and footstep bearings were separated and independent and the wharve was situated between them. In 1860, an American engineer called Erastus N. Steere, combined the neck and footstep bearing and placed the wharve above the former. Some years later, John E. Atwood, also an American, invented the Bell Wharve which encloses the neck bearing. In 1869, Francis J. Rabbeth acquired the patents of Steere and Atwood and together with Messrs. Fales and Jencks, took up the manufacture of Rabbeth Spindle. In the year 1880, Rabbeth secured the first patent for a flexible bearing unit. In this unit the neck and footstep bearings were combined in a common sleeve flexibly supported in the bolster. With this spindle, higher speeds were attained than was possible with the spindle with rigid bearings. In the year 1882, Mr. Tweedale patented the Automatic Spindle Holder for ring frame spindles. To avoid lowering the speed of spindles, separators were introduced about the year 1882 by Messrs. Furness and Young of Mellor Bottoms Mill., Derbyshire, and were called the Anti-Balloon Ring.

After this date, several improvements were made in the shape of separators, the most popular at the present time being the Blinker type which falls back when doffing After the year 1920, many improvements were brought out on the ring frame, commencing with Roller Bearing Spindles. These spindles differ but slightly in outward appearance from plain bearing spindles. The roller neck bearing and the footstep are both mounted and accurately and permanently aligned in a common rigid sleeve. The bearing insert is characteristic of the spindles It is fitted in the bolster in three different ways, according to the purpose for which the spindle is required. Thus the insert with a cylindrical contact surface has a certain amount of mobility in the bolster : the insert with a conical contact surface is held rigidly in the bolster whereas the insert with a spherical contact surface possesses still more freedom of movement than the first one. Distinctions are accordingly drawn between the type of bearing inserts. The running qualities of the spindle are further enhanced by the inclusion of a special damping sleeve

High Drafting

High drafting by means of 4 rollers, Single Apron, Casablanca system, Le Blan Roth, and the Toenniessen system, were all introduced during the last fifteen years. Tape drive to spindles superseded the band drive about 1926, although this drive had been working on doublers for many years in England and on ring frames in America. Rising and falling Lappets also were introduced a few years afterwards and then came ball bearing on jockey pulley for tape drive in the year 1932. In recent years, ball bearings were also introduced on loose Boss Top Rollers for spinning frames and a Bunching Motion for ring frames can now be fitted when required. The mechanism of the motion is to cause a temporary dwell of the cop motion cam whilst the other parts of the frame are in motion, thus causing a bunch of yarn to be made at the desired place on the bobbin or pirn. Also, a measuring device can be fitted which will measure the number of yards required to be wound on a bunch, assuming that no ends are down on the frame.

The latest innovation is a Random Slub Motion which is entirely mechanical, and the "slubs" are produced by intermittent stopping and starting of the front pair of rollers, whilst the middle and back rollers rotate continuously.

The mechanism involves very little variation from the ordinary roller driving gears, the exception being that the front roller driving wheel and the small front roller wheel are mounted rotatably on the end of the front roller forming components of a clutch arrangement whereby the front is stationary when out of gear, and the wheels loosely mounted thereon are continuously rotating and driving the middle and back rollers.

Doublers

In ordinary doubling there are three systems, dry doubling, English system of wet doubling and the Scotch system of wet doubling.

On the dry system there are no copper troughs, the yarn passes from the bobbin in the creel between two polished iron rollers on to the bobbin on the spindle, receiving a number of turns per inch as required.

Wet doubling on the English system is obtained by passing the yarn through water contained in a copper trough of a suitable section behind the rollers. Both top and bottom rollers are covered with brass, thus preventing rust and consequent staining of the yarn.

(Continued on p. 271)

Essential Textiles

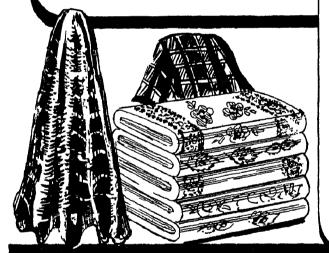
OIL CLOTH

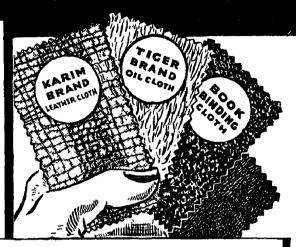
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Wet doubling on the Scotch system is carried out by passing the yarn through water whilst in contact with the bottom roller. This roller runs in water which is held in a trough beneath it and is made of brass.

A cop motion, long lift or variable long lift motion, can be adopted on these frames

An arrangement for making samples can be attached to the last section of bottom rollers and by varying the wheels it is possible to make small quantities of yarn with different turns per inch from what is being spun on the remainder of the frame.

Patent self-lubricating rings are now made for doubling machines which prevent wear.

The latest model of a Doubling Frame is the one made for producing fancy yarns. This frame is constructed with two lines of top and bottom rollers on each side, which are so geared as to stop and start at intervals; also each line of rollers can be run at different speeds one from the other, enabling fancy yarns to be made. These consist of looped, knopped, variegated and spiral yarns.

Double Twist Doubling Machine

The latest machine to be put on the market for making heavy cable yarns is the Double Twist Doubling Machine and is the invention of Mr. T. E. Andrew and Mr. M. Langstreth, of Castleton, Rochdale. This machine employs a principle of spinning or twisting entirely different from existing machines and claims important improvements in quality of folded yarn and in costs of production

The machine is for double twisting and has the unusual principle of putting two twists in the thread for each turn of spindle. These particular machines are of a gauge suitable for the twisting of fivefold 23s, such as is used in the preparation of cords for the tyre trade.

The arrangements and patents originated in the systematic analysis of the processes and products for this purpose and its development has been based on very careful calculations. In the result, however, it has not proved to be a highly specialized machine suitable only for the particular work for which it was designed and is successful. It is, in fact, considered that it will have equal, or even greater, advantages over present methods in the ordinary doubling and sewing cotton section, etc

The double-twist principle is not a new discovery, but it is not well known, and is not put into practice to any great extent. If a thread is positioned in the form of a loop, and one leg of the loop is carried round the other, a turn is put into each leg, and the two twists are in the same direction. The value of the rotation of the spindle parts is thus doubled. A further point is that neither delivery nor receiving package needs to be rotated, and only light rotating parts are required, so that high speeds can be attained. The arrangement is thus nearer to ideal principles of twisting. However, the benefits, though real, of this theoretical or scientific consideration are less important than the actual practical and technical advantages dealt with below.

A description of the mechanism will give the necessary basis for a comparison with the present methods of flyer or ring twisting, and the sequence of processes.

The cross-wound cheese of ply-wound yarn is carried on an aluminium bobbin or cheese holder in a pendulum bracket which is mounted on the revolving spindle through the medium of a ball bearing. The hinged pendulum part keeps the bottom upright, and

stationary. To apply tension the aluminium bobbin or cheese holder rests on a felt washer. The underside of the base disc of the bobbin is made with radial corrugations or shallow teeth, this feature having proved efficient as a self-cleaning device, and giving completely satisfactory tension. The threads pass from the cheese to the tube which forms the centre or axis of the spindle and bobbin bracket, out at the side of the revolving spindle, and then through a hole in the rim of a saucershaped disc, and back over the rounded rim of the disc to a thread guide, whence the twisted thread is guided round three drawing-off rollers by the usual methods of threading in doubling frames. The thread passes then to a drum winding arrangement, where it is wound by slow traverse on to double-flanged bobbins. It may be noted that the three rollers—two continuously and positively driven, and the short top roller driven by friction—serve both sides of the frame.

The yarn balloons between the rim of the disc and the thread guide round the delivery package, and the balloon is controlled by a ring which surrounds the delivery cheese. The ring is hinged underneath, and can be pressed back when a new cheese is inserted. The spindles are driven from a central tin cylinder by tapes passing over tension and guide pulleys. A brake is fitted so that the rotation of each spindle can be stopped by pressing a pedal lever controlling the brake by a light rod. The rotating spindle also runs in ball bearings in the new models. The change between right and reverse twist is quickly made.

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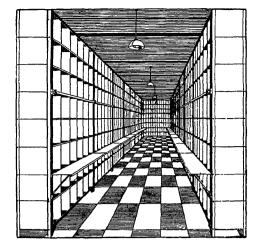
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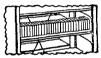


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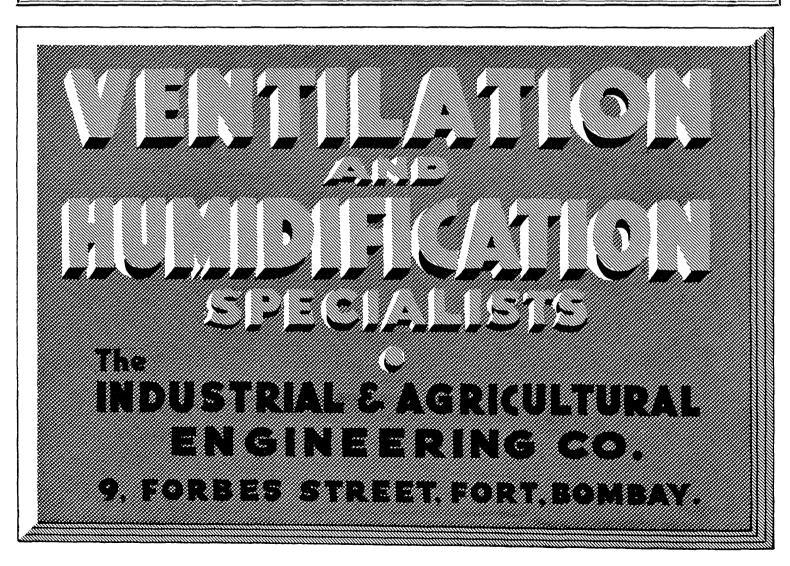
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Artificial Fibres and their Future—(Continued from p. 71)

advantages of the acetate fibre depend on its special properties which he between those of cotton on the one hand and those of wool on the other. Thus it has a warmer and a fuller feel than cotton, a more silky appearance, high resistance to creasing, high elasticity and good washability. The low hygroscopicity, low density, and non-hability to swelling are chiefly responsible for these properties. The dyeing of the acetates is a problem which is still beset with many difficulties and a new class of dyestuffs had to be introduced exclusively for these fibres. Certain vat and mordant dyestuffs have also been successfully applied to the acetate fibre. Mostly cotton linters are used for the manufacture of acetate silk but a recent important advance is the successful substitution of high-grade wood cellulose for cotton linters.

All these four varieties of art silks are manufactured either in the form of continuous filament yarn or in the form of staple fibre. The latter is only a physically modified variety obtained by cutting the filaments into staple lengths and then spun into yarn. A dull lustre viscose staple fibre which is obtained by spinning in water instead of in sulphuric acid is sold under the name of Lanusa and, although it is little used as such, it finds wide applications in mixtures to give novel fibre or colour effects.

World Production

An idea of the enormous production of artificial cellulosic fibres can be had by a consideration of the fact that, out of an annual world production of about 10 million tons of textile fibres, about 1 million tons are contributed by artificial fibres. Of this 1 million tons about 51 per cent. is sold as filament rayon and the rest as staple fibre. Whereas the production by the viscose process contributes more than 80 per cent. of the world's output of artificial fibres, acetate fibre does so only to the extent of 14 per cent. and 6 per cent. is due to the other processes. These figures clearly bring out the relative ments of the different processes practised at present. It is also important to note that the world production of staple fibre in 1938 showed an increase of 55 per cent. over that in 1937, indicating the wider market which staple fibre is capturing from day to day. Further, this entire production of artificial fibres comes principally from five countries, viz., Japan 33 per cent., Germany 26 per cent., United States and Italy 16 per cent. each, and Great Britain about 8 per cent.

With these figures in view it is of interest to consider the position of India in the field of artificial silk manufacture. At the moment the annual imports of artificial silks into India amount to Rs. 20 million and many attempts have been and are being made to replace these imports by home production. Of the various raw materials required, cotton linters, cotton waste and wood-pulp are available in India but are not produced, as such, in quantities sufficient to meet the demands of art silk manufacture. In addition to this, large stocks of shortstaple fibre, which are at the moment exported from India, can be conveniently employed for this purpose Most of the chemicals required for this industry, e.g., acetic acid, acetic anhydride and acetone are not produced in India on any large scale and caustic soda and carbon disulphide not at all. Other auxiliary products such as glucose, sizing materials, oils, dyes, etc., which are required in large quantities are not produced at present. Therefore, although it is imperative that art silk industry should be started in India at the earliest opportunity, it is unwise to depend for almost everything on

imported material and, therefore, it is desirable that everything should first be done to develop the production of the essential raw materials. In this connection it is encouraging to learn that the Government of India have sanctioned Rs 50,000 for the purchase of a test plant and experimental production on it.

The rayons manufactured by the above processes are supplemented by many others which are obtained by the regeneration of various other esters of cellulose and of these glycol cellulose and ethyl cellulose deserve special mention. Glycol cellulose is obtained under the trade name of Cellofas, which is available in a range of products of different physical properties. These glycol celluloses have certain advantages over viscose in the matter of production of artificial silk. The solutions are more stable than viscose and can be stored for indefinite periods. The rayon obtained by spinning a celluloseether solution resembles viscose rayon and has an excellent dry strength but the wet strength is rather low. Ethyl cellulose is similar to the other esters and was announced recently by the Dow Chemical Co. of U.S.A. as nearing commercial production.

New Continuous Process

Last year a striking advance in the technology of rayons was seen in the completion of a plant by the Industrial Rayon Corporation of U.S.A., for the production of viscose rayon by a new continuous process. The spinning room alone, it is reported, occupies three and half acres and the capacity of the plant is about 16 tons per day of finished yarn. This continuous process cuts down the time required to process the yarn from spinneret to the final twisting machine from the usual 90 hours to 6 minutes. An ingenious device enables washing, desulphurising, bleaching, lubricating and twisting to be performed consecutively on a series of drums, thus not only saving time but, by a better control of the operating conditions, ensuring a finished product of an improved quality.

In dealing with artificial fibres containing nitrogen, it should first be noted that various attempts have been made to incorporate nitrogen into the regenerated cellulosic fibre to give wool-like properties to the finished product. The insertion of nitrogen into the cellulose molecule has been done either mechanically or chemically. To the first group belong Cisalpha and Lacisana (Italy), and Fibramina (Brussels) which are obtained by mixing viscose dope with casein (milk protein) and coagulating the mixed dope in an acid bath. To this group also belong Rayolana (Courtaulds), and Artilana (Germany) which are obtained by incorporating synthetic resins with wool dyeing properties in viscose spinning mass or by treating the pre-formed filaments with resin components followed by resin formation in situ. Another device for obtaining similar results is to mix wool with staple fibre and spin the mixture. Fibro (Courtaulds) is one such fibre which is formed from viscose fibre cut into staple-lengths and mixed with wool to form a fibro union yarn. Vistra XT (Germany) is a viscose staple fibre specially crimpled and curled to facilitate blending with wool. Vistralan (Germany) is a similar product which takes wool dyes and Cuprama silk has likewise pronounced wool characters. Fixation of nitrogen in the cellulose molecule chemically is still under investigation and reference may be made to the nitrogen containing cellulose derivatives prepared by Du Ponts of U.S.A., from cellulose and a substituted urea. The mixture of the two components in an

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aqueous medium is heated until the cellulose derivative is produced which is soluble in dilute caustic soda. The derivative contains not less than 5 per cent. nitrogen. Filaments are produced by supporting solutions of the derivative in aqueous sodium hydroxide in the presence of an alkali zincate or beryllate and thus regenerated cellulose with fixed nitrogen in it is obtained. The filaments have distinctly wool-like characteristics and possess strong affinity for acid dyes. Their production on a commercial scale, however, has not been attempted so far.

This brings us to that class of artificial fibres which are produced from nitrogenous raw materials and which have close resemblance to wool in chemical composition and properties. To this class of fibres belong Lanital (Italy), Lactofil (Holland), Casein Fibre (Courtaulds) and Triolan (Germany). All these fibres are prepared from milk casein as the starting material. As early as in 1906 F. Todtenhaupt tried to make artificial silk from casein. He seems to have hit upon casein because it was a readily available protein with an empirical composition approximating to that of natural silk. The patent taken out by Todtenhaupt was not employed commercially, probably owing to the rapid development of artificial cellulose fibres at about the same time and to the absence of any particular demand for fibres of protein composition. In 1937, The Italia Snia Viscosa Co. began production of a synthetic wool fibre, Lanital, from casein and during the same year a German plant was licensed to operate the same process. The credit for solving the technical difficulties attending the commercial exploitation of Todtenhaupt's discovery goes to Com. Antonio Ferretti, the inventor of the modern process.

For the manufacture of casein fibres, casein is precipitated from skimmed milk at a pH much lower than the iso-electric point (4 6) and the "cheese" obtained is thoroughly washed, pressed and finally dried at a low temperature. The yield from 100 litres of milk is about 3.0 kgs. of casein and ultimately the same weight of Lanital fibre is obtained. The casein thus obtained is allowed to swell in water and then dissolved in alkali. The solution is filtered, de-ærated and ripened before spinning. The spinning is carried out on jet spinning machines of the ordinary type, the solution being extruded into a solution of sulphuric acid to which sodium sulphate is added. This coagulation is followed by washing, cutting and "fixing" of the casein with formaldehyde. The process is a discontinuous one and takes in all about 20 hours as against 20 minutes in the corresponding viscose process. The actual rate of spinning equals almost that of viscose and the fibre strength is increased by stretching. In addition to sodium hydroxide, trisodium phosphate, ammonium hydroxide, triethanolamine and a few others have been successfully used as solvents. To the solvent are also added compounds of aluminium, calcium and barium to increase the strength of the fibre and oleic acid, linseed oil or Turkey red oil to improve the flexibility of the finished product. Similarly phosphoric acid, acetic acid or sulphamic acid is also used as a precipitating agent. The casein fibres thus obtained are circular in cross-section like wool fibre and are nearly as strong as the latter. The fibre contains 53 per cent. carbon, 7 per cent. hydrogen, 23 per cent. oxygen, 15.5 per cent. nitrogen, 0.7 per cent. sulphur and 0.8 per cent. phosphorus. It is soluble in hot sodium hydroxide, but less easily than wool, which makes possible a rough quantitative separation of the two in mixtures. Casein fibre

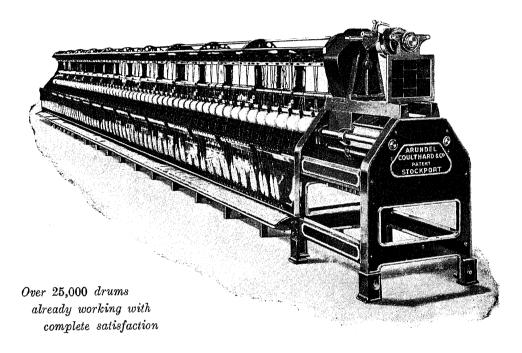
dyes similarly to wool but more quickly, and at a lower temperature and with better levelling. It possesses also a marked affinity for direct cotton colours. Although it has been stated that casein fibre is not attacked by moths the optimism in this direction is offset considerably by the recent reports from Dutch chemists who have found that bacteria which destroy proteins from casein destroy the fibre too. The most recent development in this field is the reported possibility of the use of proteins from soya-bean, pea-nut, silk waste, fish waste, slaughterhouse waste, etc. In England, the progress made in the utilization of groundnut protein is showing high promise. Under any circumstances, the present world production of casein fibre, about 16,000 tons per annum, does not seem to suggest that it is intended to be a substitute for wool but only as supplementary to wool for the production of novel and cheaper fabrics and novel effects.

Nylon

Amongst artificial fibres perhaps the greatest interest centres to-day on the resins called Nylon and Vinyon or Vinyarn, which are the first truly synthetic fibres to be produced in quantity. Both these fibres are reported from the United States and whilst the former emerged in 1938 from the Industrial Research Laboratory of E. I. Du Pont de Nemours & Co., the latter was placed on the market during the same year by the Carbide and Carbon Chemical Corporation. Nylon is a polyamide fibre and may be described as the first man-made organic textile fibre from coal, water and air. The production of a polyamide forms the initial stage in the manufacture of Nylon. The polyamide is obtained by the condensation of one or more mono-amino-carboxylic acids or certain of their esters, e.g., 6-amino-ethylcaproate, in the presence of an inert diluent of high boiling point, e.g., cresols, mixed xylenols, etc. The reaction is complete in a few hours by heating at a temperature in the neighbourhood of 200° C. The product of condensation is a polyamino-methylene-carboxylic compound of high molecular weight, which for brevity is termed a polyamide The water or alcohol produced during the condensation is removed immediately it is formed and the diluent is then recovered by distillation under reduced pressure. The rection mass is allowed to cool, when it sets to a hard stable solid, but it has been discovered that in the molten condition this can be extruded by means of a pressure head of nitrogen through fine orifices to yield filaments of exceptional properties. Later developments of this technique employ mixtures of certain diamines and dicarboxylic acids which yield by condensation products of still higher molecular weight. These are referred to as super-polyamides and are found to be better products for extrusion in the molten state. The super-polyamides are precipitated as white powder by pouring into alcohol. After filtration, washing with alcohol and drying, it is melted and the melt forced under three-pound nitrogen pressure through orifices of 0.47 mm. diameter and the extruded filaments collected on a motor-driven drum running at a peripheral speed of 82 feet per second. They are then immediately drawn out by winding on to another drum revolving at a speed of 164 feet per second, thus giving an elongation of 100 per cent. The filaments after this treatment are lustrous and silky and can be further cold drawn to a total elongation of 352 per cent. to have filaments which have tensile strength of 5.2 gms./ denier whilst that for cotton is 2 gms./denier and for silk is 4 gms./denier. Heat tests at 110° C. for a period of one month have shown no tendering of the material, but strong acids hydrolyse the filaments to the original

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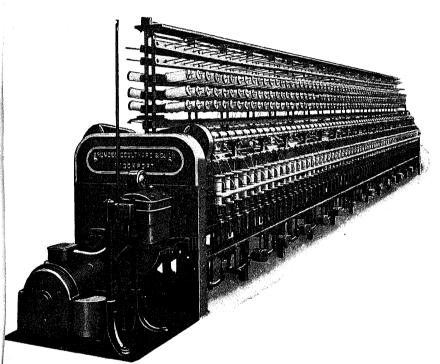
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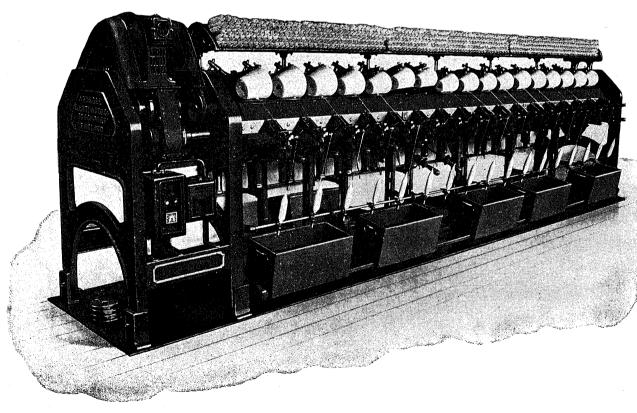
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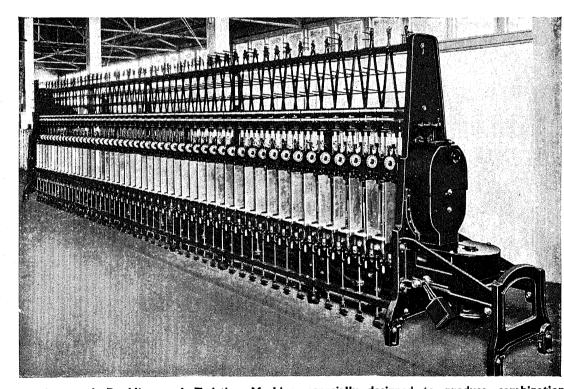
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LALGIR CHAMBERS, TAMARIND LANE, FORT, BOMBAY. diamine and dicarboxylic acid. The strength of the fibre is unchanged after five weeks of immersion in boiling water or after eight weeks of immersion in toluene or in 2 per cent, sodium oleate. The fibre has exceptional elastic recovery and is completely insensitive to changes in humidity. It shows extraordinary resistance to solvents and chemical reagents and has excellent ageing properties. The wet strength of this fibre is at least 85 per cent. of the dry strength which solves many a difficulty of the dyer. The fibres are said to have a strong affinity for dyes and to be capable of being dyed rapidly, permanently and directly with the dyes ordinarily used for silk and wool. Nylon has far better elastic recovery than silk fabric, particularly under conditions of high stretch, high humidity and long periods of time. It should also be noted that in contrast to other fabrics made from textiles. Nylon melts without catching fire when brought into contact with a hot flame. It is the combination of strength and elasticity which makes Nylon suitable for the manufacture of fine hosiery. In addition to its use as textile fibre, Nylon is also used to produce tooth-brush bristles, sewing thread, racquet strings, fishing lines, woven dress goods, velvets, knitted and woven underwear, transparent wrapping films, etc This indicates the enormously wide possibilities of the applications of Nylon and the brilliant future it has.

It has already been stated that Nylon is made from coal, water and air. This is so because the dibasic acid and diamine required for the production of a superpolymer are both derived from phenol which is commonly prepared from bituminous coal. Oxygen from the air is also needed for making the dibasic acid and ammonia made synthetically by causing hydrogen from water to unite with nitrogen from the air for the diamine.

During 1939 Nylon has already gone into production and the first American plant employs 850 persons, not counting those required in another plant where the intermediate materials are prepared Production is soon expected to commence in England where three factories are under construction and are almost nearing completion. Considering the unique properties of the fibre, it is not at all surprising that great enthusiasm should be shown by all concerned in the production of Nylon. One must, however, wait and see whether it could be placed on the market at a competitive price, but there is no doubt that this fibre will shortly attain a commercial production which it so richly deserves.

Vinyarn

The Carbide and Carbon Chemical Corporation's "Vinyarn" is apparently a hydrocarbon-like material made by polymerizing a vinyl-ester compound such as vinyl chloride or a mixture of chloride and acetate. Polymerides are dispersed in acetone at about 50° C., the dope is then filtered under pressure deærated and then spun into filaments which may be twisted and/or doubled to form a yarn which is mechanically stretched to about 200 per cent. in cold water containing a wetting agent. The tenacity and elongation of the yarn are controlled by the degree of stretching and subsequent contraction is prevented by ageing the product under tension at less than 75° C. Soft flexible fibres are thus obtained which may be woven or knitted. The polymers, in addition to their use as a base for the manufacture of fibres, are also used as adhesives, impregnating agents and mouldings, etc. From these vinyl resins can be manufactured filaments with demers lower than that of natural silk. Vinyon is neither attacked by bacteria nor

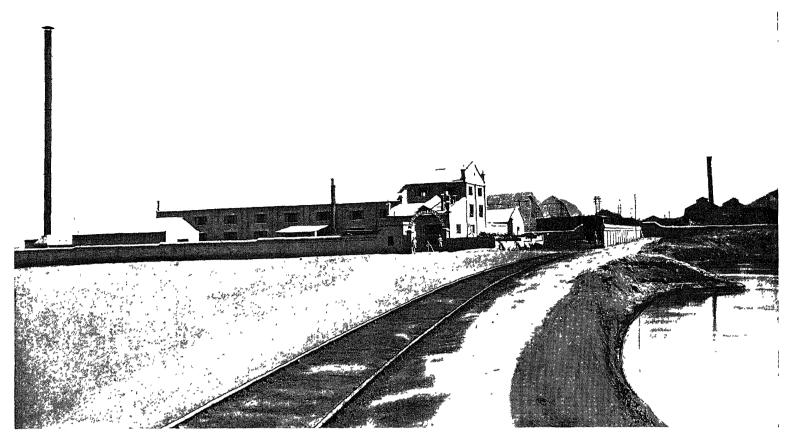
by fungi and is very resistant to chemical attack. Its dyeing characteristics, however, are not too attractive and it develops static charges when subjected to friction. The recent allegations that dermatitis is caused by these vinyl plastics does not speak very well for their future. The material is now on the market as fibre Vinyon made by the American Viscose Corporation, as felt by the American Felt Co., and as filter-cloth by Wellington Sears & Co. A similar fibre made from vinyl chloride, hydrochloric acid and acetylene is reported from Germany. It is called "Mineral Fibre" and is intended for filter-cloths, diaphragms, jointings, fishery appliances, etc. It is claimed to be unaffected by water, to be non-inflammable, mould resistant, stable to nearly all acids and alkalies and to possess a high strength and elasticity. Anyway, by comparison with a similar product reported from the United States, there appears to be greater truth in this announcement than in the "Synthetic" fibre made from coal and chalk and exhibited as a German product at the Leipzig Fair of 1937.

The development of these two fibres, Nylon and Vinyarn, forms one of the most important milestones in our attempts to produce artificial fibres, and specially so, because both these fibres are made of materials polymerised from small original molecules involving no cellulose in their composition.

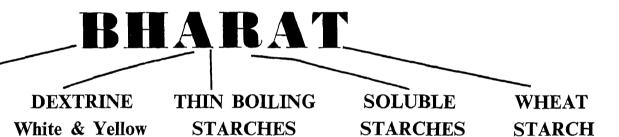
Glass Fibres

Nor are all the developments restricted to the production of silk or wool-like fibres. Through the joint researches of the Owens Illinois and the Corning Glass Companies, glass fibres of remarkable properties are now available. Fibrous glass is now being manufactured by the Owens Corning Corporation, a joint concern of the two, with individual filaments very much finer than the finest fibres spun from viscose or acetate silks. The tensile strength of these fibres is comparable to that of steel. Although the advances made with this fibre do not justify its use as a textile fibre, tapes and other fabrics made from fibre glass are extensively employed in electrical insulation, for gas and liquid filtration and for decorative purposes where protection from fire is essential

What has been said so far about artificial fibres has been said in brief and in the limited space available it has not been possible to go into fuller and more interesting details. From this survey one can hardly fail to judge the extent to which man has succeeded in his attempts to be independent of nature in his requirements of textile fibres. The present-day production of acetate silks alone equals, if not exceeds, the production of natural silk, and with the coming in of the Nylons and Vinyons the future of natural silk seems very doubtful indeed. It is clear that we are slowly understanding the principles which govern the formation of natural fibres in plants and animals and are in a position to imitate this process to a large degree. It cannot be denied that the progress that has been made during the last 50 years in the production of artificial fibres is great, yet it is needless to emphasize that we are far from the end of this romantic chapter. Scientists and industrialists must plod on for "mankind is impatient and will not wait." If the rate at which we have progressed so far is maintained there is no doubt that the scientific achievements of the future will completely eclipse those of the present day and we will soon manufacture fibres which will excel in quality and quantity any that nature can produce.



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Industrial Disputes and their Settlement—(Continued from p. 29) separately for the reference of the dispute to a Court or a Board, it is obligatory on Government to appoint a Court or a Board provided that Government are satisfied that persons applying represent the majority of each party. A Court of Inquiry may be composed of an independent chairman and other independent persons or only one independent person. It is the duty of a Court of Inquiry appointed under the Act to investigate and report on such questions connected with disputes as might be referred to them, but the settlement of the dispute would then depend upon the force of public opinion on the findings of the Court. A Board of Conciliation instituted under the Act may consist of one independent person or one independent chairman and two or four other members representing the interests of both the parties to a dispute. The Board of Conciliation is to endeavour to secure a settlement of the dispute. Both Courts and Boards are empowered under the Act to enforce the attendance of witnesses and the production of documents. Neither party is under any obligation to accept the findings of a Court or the advice of a Board, but in practice both parties are expected to do so.

The second part of the Act relates to public utility services and makes it a penal offence for persons employed in such services to go on strike without giving 14 days' notice in writing to the employer of their intention to do so. The principle on which the provision of penalties has been made under this Act is that persons whose work is vital to the welfare of the community generally should not be entitled to enter into a strike before sufficient time has been given to examine the merits of their grievances and to explore the possibilities of a settlement. Provisions of a somewhat similar type are also to be found in the Indian Post Offices Act, and in a number of Municipal Acts in India; and the principle is one which has been widely accepted in other countries.

The third part of the Act is an important part of the legislation. It relates to illegal strikes and lockouts and the sections closely follow the provisions of the British Trade Disputes and Trade Unions Act, 1927. These sections, however, lose a lot of their value as they are applicable only to those strikes and lockouts which satisfy the following two conditions: firstly, the strike or lockout must have objects other than the mere furtherance of a trade dispute, and secondly, the strike or lockout must be designed or calculated to inflict severe, general and prolonged hardship upon the community. Persons furthering illegal strikes or lockouts are punishable with imprisonment to the extent of three months or with fine which may extend to Rs. 200 or with both.

The life of this enactment was originally for five years, but in 1934 it was permanently placed on the Statute Book, as had been recommended by the Royal Commission on Labour. Since 1929, the Act has been made use of only on four or five occasions. The Bombay Government in 1929 appointed a Court of Inquiry consisting of a High Court Judge and two other independent members to investigate a number of matters connected with the general strike in the Bombay cotton mills. A Board of Conciliation consisting of a retired High Court Judge as chairman and representatives of the two parties was appointed at the end of 1929 with reference to a dispute in the B. B. & C. I. Railway which arose over the question of the transfer of a number of workmen from the Railway Workshop in Bombay to a new workshop at Dohad. The Board was unable to effect an agreed settlement and the members themselves differed on certain points. In 1931 a Court of Inquiry was appointed to

inquire into and report on the grievances of the large number of workers who were retrenched on all Indian railways. Another Board of Conciliation was appointed by the Government of Burma in 1930 in connection with a service dispute among the dock workers. It will be seen that the Industrial Disputes Act, 1929, has not been made much use of. Its provisions have been invoked on very few occasions. Although the principle of conciliation has been adumbrated in the Act, in practice it has not been found to be of much assistance in the matter of prevention of strikes. As regards the settlement of industrial disputes, the procedure of Courts and of Boards of Conciliation prescribed under the Act, without any preliminary conciliation machinery, has been found to be rather cumbersome, and at times inconclusive and unhelpful.

During the period from 1929 to 1934, there was a marked decline in labour unrest as compared with the preceding years. One of the reasons perhaps was the appointment of the Royal Commission on Labour in India in 1929 and several inquiries which were instituted at the instance of this Commission. The Royal Commission's Report was published in July 1931 and it was followed in the succeeding years by a period of intense legislative and administrative activity on the part of the Central and Provincial Governments, designed to improve the lot of the workers and to promote industrial peace.

One of the most important landmarks in the history of industrial strife in the Bombay Province was the passing by Lord Brabourne's Government of the Trade Disputes Conciliation Act in 1934. This was introduced almost immediately after the termination of a semigeneral strike in the cotton mill industry of Bombay in that year. The principal features of this Act were the appointment of a Labour Officer, a Government servant, to look after the interests of the cotton mill workers in Bombay City, to represent their grievances to their employers and to secure redress of such grievances, and (2) the appointment of the Commissioner of Labour as an ex-officio Chief Conciliator to whom the Labour Officer could bring up cases in which he could not succeed This Act was simple and short, containing only 22 sections, and it was easy to interpret and to work. The main provisions of the Act related to the procedure in regard to conciliation machinery instituted by it. If a trade dispute existed or was apprehended, either or both parties to the dispute would apply, or the Labour Officer himself could make a reference, to the Conciliator. In almost all cases conciliation proceedings were held at the instance of the Government Labour Officer, and it was rarely that either party applied at this period to the Conciliator for a settlement. The Chief Conciliator was given powers to summon parties and witnesses and to call for such documents as might be necessary. If, as a result of these concultation proceedings, a settlement of a trade dispute were arrived at, the settlement was to be signed by the parties. If, however, no settlement was arrived at, the Conciliator was required to make a full report to the Governor-in-Council setting forth the particulars of the proceedings and the steps taken by him for the purpose of ascertaining facts and circumstances relating to the disputes on account of which a settlement could not be made.

The Government of Bombay of that time was fortunate in having at its disposal two officials who proved themselves ideal incumbents of the newly created posts. In their respective capacities these two gentlemen did more for the Bombay mill operatives and did more to

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pave the way for industrial peace and reasoned negotiation between employers and employees than has ever been done by any other individual or body. Mr. [F. Gennings, C.B.E., C.I.E., brought to the task of Chief Conciliator a degree of sound common sense which, combined with his mature experience and his impartiality, brought him the respect of both parties, and enabled him repeatedly to settle disputes which might otherwise have led to widespread trouble. It was during Mr. Gennings' regime and largely due to the co-operation induced by Mr. Gennings' qualities, that the Millowners' Association, Bombay, established its Labour Officer's Department and commenced its efforts to persuade mills to employ their own Labour Officers and to eliminate those minor but exasperating abuses which did exist in some mills

It may be said that the first body of employers in India to establish a Labour Department and to attempt an organized campaign to eliminate anomalies in working conditions and in wages, was the Millowners' Association of Bombay, and the success of their efforts, efforts which are now being followed in other industrial centres in India, is due to the unflagging interest taken in this vitally important matter by the Millowners' Secretary, Mr. T. Maloney, during and since his contacts with Mr. Gennings.

The first Government Labour Officer to be appointed ın Bombay, or ın fact ın India, was Mr. W. B. Gilligan, I.C.S., who was appointed under the Act in 1934. Mr. Gilligan's work entailed long hours among most uncongenial surroundings, his hours continued late into the night in the office which he established in the mill workers' midst. The union used his good offices on occasions suitable to themselves, but in general did whatever they could to prevent Mr. Gilligan obtaining the hold over labour which they were again working to obtain themselves. Despite this, however, and despite the initial lack of co-operation, and in some exceptional cases active opposition from one or other of the more backward mill executives, Mr. Gilligan speedily established his position as the operatives' advocate. His relinquishing of the position was a matter of regret among both employers and operatives.

During the life of this 1934 Act as many as 95 disputes were referred to the Chief Conciliator and although his function was to endeavour to persuade disputants to a compromise or agreement, he eventually came to be regarded almost as an Industrial Judge whose decisions were generally accepted as final by both parties.

It may be again emphasized that, for the first time in the history of the relationship between employers and employees in India, machinery for the representation, investigation and speedy redress of day-to-day gnevances of workers was set up, under the Bombay Trade Disputes Conciliation Act. The achievement of this statute was the speedy and satisfactory disposal of individual grievances, and anybody acquainted with the history of industrial disputes in this country will certainly appreciate the importance to the maintenance of industrial peace of not permitting even minor grievances to accumulate unheard and unredressed. It may be mentioned that, as far as the employers were concerned, a convention was established of referring only matters pertaining to wages, conditions of work, etc., affecting a body of workers, to the Conciliator, and endeavouring to settle all individual grievances by discussion between the Government Labour Officer and the Association Labour Officer.

The statistics of industrial disputes for the period of five years during which this Act was on the Statute Book shows that there was far more industrial quietude than during any earlier period During the years preceding the introduction of this Act, ie, 1930 to 1934, both inclusive, there were 113 disputes involving 223,000 workpeople resulting in a time loss of slightly over 4 million working days. The corresponding figures for the five years from 1935 to 1939 were 69 disputes, 103,000 workpeople and 589,000 working days lost In short, the Bombay Trade Disputes Conciliation Act met with considerable success as far as the cotton mill industry is concerned during the five years of its existence This success was largely due to the simplicity of the enactment, able administration by the Commissioner of Labour and the Government Labour Officer and to the fullest co-operation of the Millowners' Association who had adopted a forward labour policy

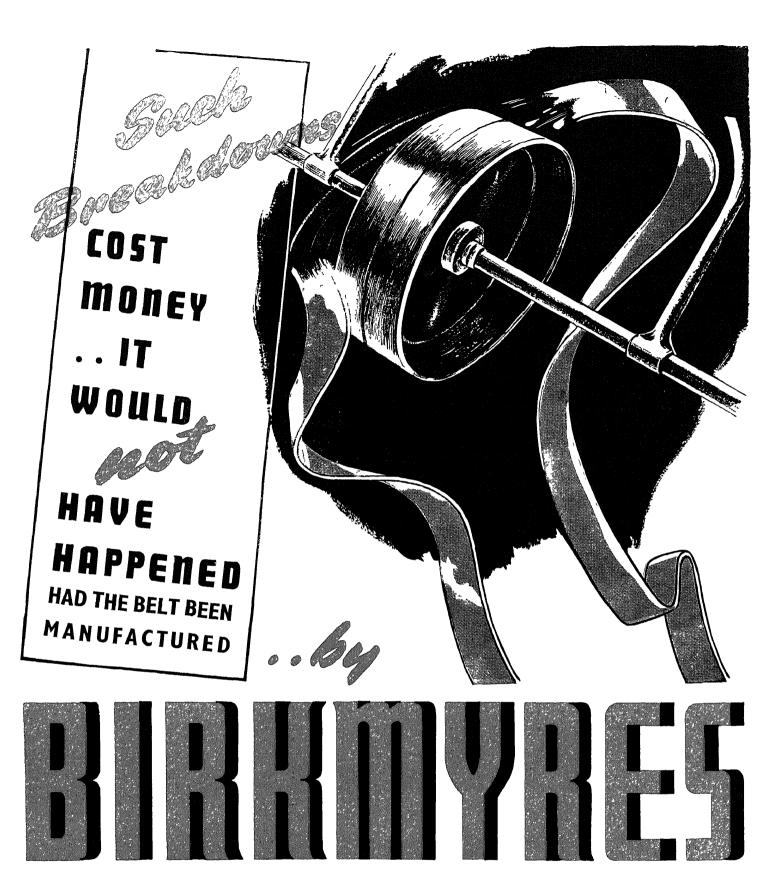
This period and the experience gained paved the way for everything that has followed. The Bombay Act of 1934 did not, however, totally prevent ill-advised strikes. On several occasions, the workers resorted to direct action first and the disputes were referred to the Conciliator. There was nothing in the 1934 Act that made it obligatory on the parties to a trade dispute to endeavour to obtain a settlement by negotiation and conciliation before resorting to a strike or a lockout

The inauguration of provincial autonomy and the accession of the Congress Party to power, which was followed by the release of certain labour leaders and the publication of Government's programme of labour policy, raised unwarranted anticipations in the minds of the workers. The result was that there were sporadic strikes during the last half of 1937. The Bombay Government, however, announced the appointment of a Committee of Inquiry with comprehensive terms of reference and further directed them to make an interim report regarding wages. The Committee published its interim report in February 1938 recommending an interim increase in wages approximately equivalent to 12½ per cent. The recommended increase was based on assumptions which were extremely controversial, to say the least, but the employers decided to purchase peace by accepting the recommendation, and this despite the very adverse effect the increase must have on Bombay's continued ability to compete in the coarse to medium count trade.

This Committee deliberated for a period of two years before completing its final report which was apparently still-born, as the public has not yet seen its contents. Shortly after assuming office, the Congress Government announced its policy with regard to industrial workers and issued a *communique* on the subject on 17th August 1939 in which it was stated as follows.—

"With regard to trade disputes, Government are determined to pursue an active policy with a view to maintaining industrial peace in the Presidency, endeavouring all the time to see that the workers obtain a fair deal. It is the intention of Government to promote legislation aiming at the prevention of strikes and lockouts as far as possible. The basis of this legislation would be the requirement that no reduction in wages or other changes in conditions of employment to the disadvantage of the workers should take effect till they had had sufficient time and opportunity for having the facts and merits of the proposed change examined and all avenues of peaceful settlement of the dispute explored either through the channel of voluntary negotiation, conciliation or arbitration or by machinery of the law. A corresponding obligation would rest on the workers in respect of demands on their behalf."

The above extract lays down the main principles of a Bill which the Congress Government framed in February 1938 and which was circulated for the opinion of the persons or bodies concerned. The draft Bill was revised and considerably amended and was introduced in the Legislative Assembly in its new form in September



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1938. There were lengthy debates in the Assembly extending over weeks and the representatives of labour vehemently opposed its introduction tooth and nail. The leaders of the Red Flag Union also organized a one-day general strike in cotton mills in Bombay on 7th November 1938 in order to protest against the Bill

The important provisions of the Bombay Industrial Disputes Act which came into effect from 1st August 1939 can be divided into three parts, relating to:

- (1) the registration of trade unions which have been recognized by the employers or which fulfil certain requirements as regards membership,
- (2) the formulation of Standing Orders for operatives,
 (3) the procedure to be followed for effecting changes in wages and conditions of work desired by employers or employees.

As regards the first part, the Act makes provision for giving a certain status with well defined duties to different types of unions. No union which has not been registered under the Indian Trade Union Act, 1926, will have any place under the Bombay Industrial Disputes Act, but a union which has a membership of 5 per cent. of the total number of employees employed in an industry or in an occupation of an industry and which has been recognized by the employer or employers concerned, or any union which has a membership of 25 per cent. of the total number of employees can apply to the Registrar for registration under this Act as a "registered union". A 5 per cent. union which has not been granted recognition by the employer or employers concerned can apply to the Registrar for being declared as a qualified union. Any registered union which has a membership of 25 per cent. of the total number employed in an industry or occupation can apply to the Registrar for being declared as a representative union. The Act makes no distinction between "industrial unions" and "occupational unions" and contains provisions for the registration of such unions as possess the most representative character.

As regards the second part of the Act, Schedule I attached to the Act gives a list of the matters in respect of which all employers in an industry to which the Act has been applied are required to frame Standing Orders for regulating the relations between themselves and their employees. The Standing Orders have to be submitted to the Commissioner of Labour within a period of two months from the date of the application of the Act and the Commissioner of Labour is empowered to settle these orders after consulting all interests concerned in the industry. Any person aggrieved by the Standing Orders so settled is entitled to appeal to the Industrial Court within 15 days from the date on which such Standing Orders come into operation

The schedule attached to the Act gives a list of all the matters in respect of which every employer in an industry to which the Act has been applied is required to give notice to the representatives of employers or the Government Labour Officer, as the case may be, before he can make any change from an existing condition. These matters include wages, total weekly hours of work, withdrawal of any customary concession or privilege, or change in usage, introduction of rationalization or other efficiency systems of work, reduction in the number of persons employed, etc. A period of a fortnight is allotted for direct negotiations between the employer and the elected representatives of employees. If no agreement is reached the matter has to be referred to the Conciliator who endeavours to bring about a settlement. If a settlement is arrived at, it is recorded. After the completion of any unsuccessful conciliation

proceedings, it is left to the parties concerned to effect the change originally intended, and a strike or lockout declared within two months from the date of the publication of the Conciliation Report is not considered to be illegal. A dispute which is not settled by the Conciliator may be referred by Government to a Conciliation Board. It shall necessarily be referred to a Conciliation Board if both the parties agree to that course. It is provided in the Act that it shall be illegal to make any change in wages, hours of work, holidays, Standing Orders, number of workers employed in different departments, system of work, etc., before the completion of conciliation proceedings started after giving due notice. It shall also be illegal to make any such changes in violation of agreements, awards or settlements arrived at under the Act. Penalties are also provided for illegal changes or for acting in contravention of Standing Orders settled under the Act.

The Act also provides for voluntary arbitration in cases where an employer and a registered union come to an agreement to submit disputes to arbitration. Courts of Industrial Arbitration are constituted for dealing with matters under the provisions of this Act. This Industrial Court shall consist of two or more members, one of whom shall be its president. The qualification for the appointment as a member of the Industrial Court is that he should be, or has been, a Judge of the High Court, or is eligible for being appointed a Judge of such Court.

The working of the Bombay Industrial Disputes Act for the period of 12 months from 1st August 1939 to 31st July 1940, shows that as far as member mills of the Millowners' Association are concerned, in all 132 notices of change were given under section 28 of the Act. Of these, 110 notices of change were given by managements while the remaining 22 were given by workers. A classification of the subject-matter of the changes notified indicates that nearly 75 per cent. of the cases related to the retrenchment of workers, discontinuance of departments, partial closure of departments working on day shift and reduction in weekly hours of work on introduction of three-shift working It is very instructive to note that in 85 cases out of a total of 132 notices of change given, the mill management concerned were able to reach agreement with the elected representatives of workers by direct negotiations. Of the remaining cases, 24 were referred to the Conciliators appointed under the Act and settlements were recorded in all cases except four. In these four instances, with the exception of one, the recommendations made in the report of the Conciliators were ultimately accepted by the workpeople concerned and they did not resort to direct action after the publication of the Conciliators' report in the Gazette.

This brief account of the action taken by the mill managements in Bombay suggests that the Act has been working smoothly and with a measure of success, and this despite the fact that the Act is a very difficult piece of legislation, the original drafting of which leaves much room for clarification. Since the enforcement of this Act, there has so far been no case of an illegal change referred to the Industrial Court in respect of any of the member mills of the Millowners' Association, Bombay. There have been, however, seven or eight strikes during this period, and four of these which were referred to the Industrial Court were eventually declared to be illegal. (Continued on p. 287)



The recent dispute regarding the grant of a dear food allowance to the Bombay cotton mill workers was referred to the Conciliation Board constituted under this Act. This was the only Board so far appointed, and it is interesting to note the opinion of the members of the Board as regards the prospects of settlement of disputes by conciliation. The report states:

"The experience gained in the course of these proceedings does not encourage the hope that conciliation as a method of bringing about a settlement of industrial disputes like the present one is likely to be successful in future in Bombay"

As previously mentioned, this Act is a cumbrous one and calls for compliance with a very complicated and lengthy procedure, and in many cases, the utility of such a procedure is of a doubtful character. The fundamental principles underlying the Act are good, but the inclusion of provisions relating to trade unions, their status and rights, the wide scope of Schedule II, and the lengthy rules framed thereunder, have made this legislation difficult to interpret, and difficult to operate. The experience so far gained, definitely indicates that the Act requires to be amended in several directions in order to enhance its utility and facilitate the fulfilment of the main object for which it has been enacted

It may not be out of place here to record that although the accession to power of the Congress Party did lead in the early days to a considerable amount of hesitation and a disinclination to take any steps to deal with industrial matters, on the part of subordinate officials in the districts, the Congress Government in Bombay Province eventually showed a directness of purpose and vigour of action in dealing with industrial hooliganism which completely restored the confidence of every law-abiding worker and of every employer.

For the past twenty years, the employers in Bombay have been asking for some form of governmental machinery to deal with trade disputes and with lightning strikes, but it will be seen that it is only within the past decade that this matter has received the attention it deserves. The Province of Bombay with its important industrial centres of Bombay City and Ahmedabad, and several smaller industrial districts, has not merely led the way but still stands almost alone in the progress made. The cotton industry in India is keenly competitive and the interests of the several provincial cotton mill industries in the large consuming centres overlap. However helpful and desirable labour legislation may be, its operation and the restrictions inherent in it cost the employer directly and indirectly, more money in wages and salaries per unit of production. The necessity for labour legislation to be standardized on an all-India basis, and not to vary greatly from Province to Province, is too obvious to need emphasizing. The wages cannot be standardized at one level throughout India as conditions of life and costs of living vary tremendously, but the adoption of one uniform labour code in all Provinces would undoubtedly lead to an upward revision of wages and earnings in some of the low-paid centres in Madras Province and in the States.

It is possible that the Ahmedabad system of private arbitrations, dependent as it is upon personalities, may gradually cease to function, but the excellence of the trade union there will at least greatly facilitate settlements under the present and any future legislative machinery. In Bombay City much will depend upon the

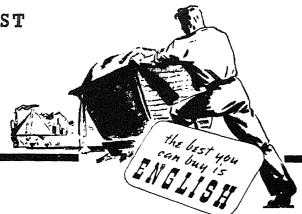
success or otherwise of Mr Nimbkar's efforts to make the union a disciplined real trade union; he is hampered by the deplorable past history of this union, by the continued efforts of other leaders to capture the organization again as an instrument of Communist propaganda, and also by the Bombay worker's disinclination to support financially any union at all except on the pay-day immediately preceding a strike. There is no union in Bombay of the Ahmedabad type and no other union has ever managed to secure the adherence or obedience of any large number of Bombay workers. Without a real trade union to speak for the employee no legislation can satisfactorily settle disputes, and no penal clauses can be enforced adequately against the individual worker. In Northern India the Cawnpore employers have adopted a realistic and progressive labour policy but their efforts have been largely rendered nugatory by an undisciplined labour force, an avowedly Communist body of labour leaders with no interest at all in the industry and a very secondary interest in the workers' conditions. The attitude and ideas of the late United Provinces Government on labour matters were so fantastic at times as to prove merely their individual lack of knowledge of the problems in the mills The settlement of those industrial disputes which post-war conditions will inevitably bring is likely to be an extremely difficult matter unless adequate official machinery to prevent strikes and to provide means of calm consideration and discussion prior to a strike, is set up by the Central Government or by the Provincial Governments.

In Southern India and in Bengal the labour problem, so far as the cotton mills are concerned, has never been very acute, and legislation on the lines of that in force in Bombay would probably prevent future serious trouble if competent trade unions able to control their members, came into being, and once the initial difficulty of obtaining suitable Conciliators, Labour Officers, and personnel for Industrial Courts were overcome. In the beginning, of course, everything is weighted in favour of labour. A natural human sympathy is inclined to make any official, completely unacquainted with working conditions inside a mill, an easy victim to representations which even the average trades union official would brush aside as absurd. In Bombay we have been, and are, fortunate in our Labour Office officials and in our Industrial Court, but it is not easy in every Province to find suitable officials of sufficient independence of mind not to be unduly influenced by the Ministry which happens to be in power, nor to find the personnel of an Industrial Court able to ally to their integrity and impartiality an understanding of the internal problems of the mills.

Many of us must remember occasions 20 years ago when industrial disputes were dealt with by the use of picking sticks on the part of labour and the hose pipes by the mill management, followed by a strike or lockout. In more recent years, in Bombay and in some other centres we passed through a period when mill staffs went about their duties daily under very real threat to their lives. That phase has passed, we hope, and although we have still a long way to go before we can be sure that capital will not be recklessly dissipated and workers reduced to the verge of starvation by unnecessary strikes, we are at least on the road to conditions under which differences of opinion can be discussed dispassionately and referred to an impartial arbiter.

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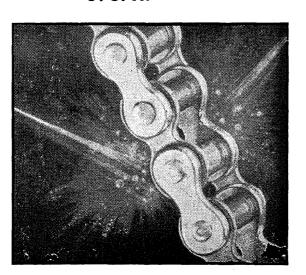
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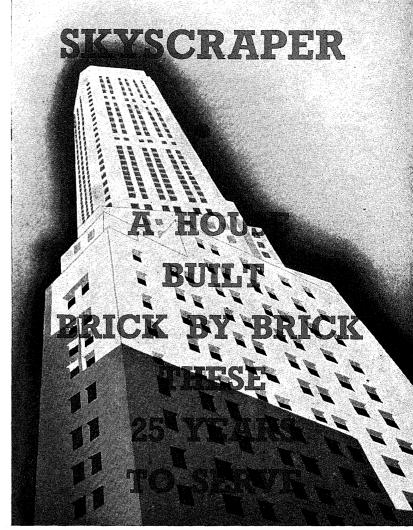
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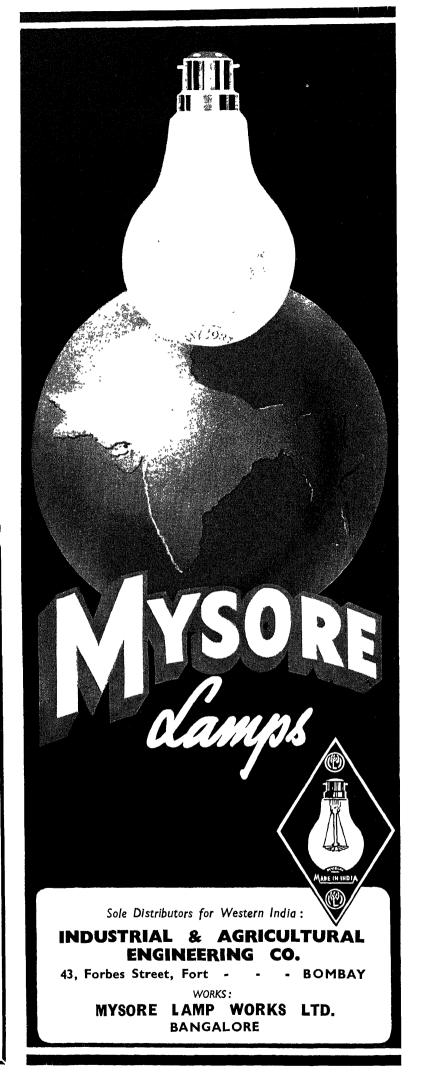
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Evolution of Cotton Trade of Bombay—(Continued from p. 23)

tatives on the Board could be Indians. Under this constitution, the right of voting at the general meetings of the Association was vested in the above Representative Committee of 90 only.

- 12. This organization worked fairly smoothly at the start and complete control was vested in the trade in that there was no Government official as Chairman.
- 13 After the East India Cotton Association commenced functioning the Association approached the Government of Bombay to give them legislative powers on the lines granted to the Cotton Contracts Board. The Government introduced a Bill in the then Bombay Legislative Council and an Act, called the Bombay Cotton Contracts Act, No. XIV of 1922, was enacted giving power to the East India Cotton Association to regulate dealings in cotton in Bombay. The Association is at present functioning under the Bombay Cotton Contracts Act of 1932 (Bombay Act No IV of 1932).

Critical Situations in the Cotton Market

- 14. The following record some of the most critical situations in the cotton market:—
- (a) In 1912, Messrs. Balchand Ugarchand applied teji for 200,000 bales Broach cotton at a premium of Rs. 4 on Rs 316 per candy about a month before the due date, i.e, 25th March 1912. Immediately after the teji was applied, prices began to fall and Messrs. Balchand Ugarchand stood to lose their premium money. To save themselves from this loss, they started buying in both the ready and forward markets in order to force up prices and their purchases in the former market amounted to 150,000 bales and in the latter to 100,000 bales at prices ranging from Rs. 320 to Rs. 351 the highest, although offerings were made at prices much lower than their actual purchase price, with the result that the rate on the 25th March 1912, the due date, was fixed at Rs 349 and Messrs. Balchand Ugarchand made a profit on their teji transaction. After the due date, Messrs, Balchand Ugarchand sold most of the cotton bought by them in the ready and forward markets at Rs 325, and although by doing this they sustained some loss, on net results they came off gainers.
- (b) In March 1921, the failure of a bull operator to carry out his obligations caused a crisis and necessitated the fixing of minimum prices by the Cotton Contracts Board. Confidence remained shaken for some time but a considerable amount of investment buying by outsiders eased the position and was followed by a good inquiry from Europe and Japan, with the result that prices began to move upward.
- (c) During the season 1921-22, there were several attempts to manipulate the market but the one worthy of notice was the attempt to corner Oomras for Dec.-January delivery by Messrs. Oomar Sobani and others. These operators were flushed with their success in a similar attempt on the previous September Oomra position, but the facility with which sellers were able to bring cotton from the Berar and C.P. into Bombay during the month of January told against the corner party and they were compelled to unload; this factor was the principal reason of the break in rates between 31st December 1921 and 8th February 1922.
- (d) In 1922-23, during the regime of the East India Cotton Association, there was an unsuccessful attempt to corner the September Oomra contract by

Messrs. Sangidas Jesiram who, being unable to meet their habilities, were posted as defaulters along with about a dozen others. The failure of the September Oomra manipulation severely shook the credit of the market, which had to find, as a result of this speculation, something like 80 lakhs of rupees in order to pay for the undue inflation of the Oomra contract created in spite of general trade factors and in face of a decline in Americans of two cents per lb.

(e) In 1923-24, no attempt was made to corner any local position but the market suffered a severe crisis, which threatened to engulf a large proportion of the brokers and to cause a financial catastrophe in Bombay In November 1923, New York rose over 6 cents and this caught the local market with exporters long and commission houses, option dealers and bazar operators short. With a rapidly rising market, it became evident that the fortnightly clearing would not go through without many failures, some of them most important ones, and the settlement was several times postponed in order to aid the bazar to settle their differences. Finally, after many meetings of those interested, the Association fixed maximum rates for Broach at Rs 700 and trading, except for settlement business, was prohibited for several days. The settlement eventually took place without a single defaulter and amounted to the huge figure of Rs. 1,88,00,000.

The Association, owing to fear of a squeeze, prohibited trading in July/August 1924 Broach, but enabled trading in April/May 1925 to commence before the expiration of the old contract.

- (f) In 1924-25, owing to late rains in the Oomra districts there was an almost entire absence of red leaf cotton, and consequently there was a fear that there might be serious manipulation of the Fine Oomra Hedge Contract. As it was, the December/January Oomra Contract which in July/August (at the beginning of the season) was selling at a discount of Rs. 30 under the price of April/May Broach, as it neared maturity began to sell at a premium of Rs. 15 over Broach. In order to prevent harmful manipulation, the Association decided not to allow trading in the May and July Fine Oomra Contracts after 25th March 1925. This restriction was justified by the actual conditions prevailing in May and July.
- (g) In 1929-30, during the month of June 1930, a heavy fall in commodity prices throughout the world led to a perpendicular fall in prices of cotton, ready and forward, causing uneasiness to holders of spot cotton ın Bombay. The disturbed political conditions throughout India aggravated this uneasiness. Meetings of members of the Muccadums' Association and the Brokers' Association were held and a general desire was expressed that minimum trading rates should be fixed. The Directors of the Association convened an emergency meeting of the Representative Committee on 9th June 1930, at which a general desire was again expressed that minimum rates should be fixed. At a meeting of the Board held later on the same day minimum trading rates were fixed for July and July/August deliveries, the rate for July/August Broach being fixed at Rs. 240.

As the American market fell further immediately after the fixing of the rates, it was impossible to maintain the rates thus fixed. During the period they were in force, however, the complicated state of the forward

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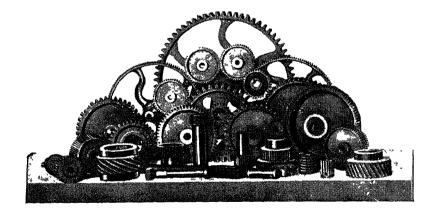
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market was to some extent cleared up and, when all restrictions on trading were removed on 28th June, the market was better able to face the continued decline in cotton. Trading in new crop contracts which started on 9th June also materially helped to ease the situation.

The inward payment day of the end-June settlement was put off for four days at the request of certain sections of the trade. The Board was satisfied that this concession gave the required relief to the relative sections of the trade and only four failures occurred in the settlement.

The Board also postponed the first two tender days in July. This policy met with gratifying success, as the heavy tenders made early in July were taken up with comparative smoothness and more confidence began to prevail.

The Clearing House

15. Till the year 1918 when the Cotton Contracts Committee came into existence, differences on forward business in cotton used to be paid only once a year at the expiry of the delivery period of each contract, and this added considerably to the risk of operators in the market as lakhs of rupees might be due by a bull or a bear on the forward market and there was apprehension of trading beyond means and capacity. All this came prominently before the lay public when Broach cotton reached about Rs. 700, and the Government of India took a hand in organizing the financial part of the cotton trade in 1918. As far as the trade itself was concerned, there were no heavy failures to speak of as parties in the trade acted comparatively cautiously and unlimited credit was never the rule. However, a Clearing House for clearance of fortnightly differences in forward contracts was established in 1918 and the amounts handled by the Clearing House during the last 22 years are given below:—

Year	Amount	Year	Amount
1918-19	Rs. 14,40,57,653 10,79,44,433 4,72,10,683 12,98,94,566 7,69,37,399 9,16,95,270 3,18,59,196 3,54,99,096 7,66,70,923 9,44,42,459 4,30,99,488	1929-30 1930-31 1931-32 1932-33 1933-34 1934-35 1936-36 1936-37 1937-38 1938-39 1939-40	Rs. 4,46,63,180 3,60,80,817 4,89,12,122 4,48,33,077 4,25,28,389 5,44,96,538 4,63,50,359 4,59,89,206 7,93,80,063 4,31,79,602 13,84,71,834

It is interesting to note that during the year 1921-22 the amount cleared at one settlement clearing, i.e., of the 28th October 1921, amounted to Rs. 1,63,00,000 and two years later, during the regime of the East India Cotton Association Limited, the amount cleared at one clearing, i.e., the settlement clearing of the 30th November 1923, amounted to Rs. 1,88,00,000. Recently, in the settlement clearing of the 13th December 1939, the amount cleared was Rs 1,43,79,000 and in the settlement clearing of 29th January 1940, Rs. 1,97,40,000, the highest clearing on record in Bombay.

16. Another function of the Clearing House is to pass on delivery orders tendered against the various hedge contracts to their respective buyers and the table below shows the number of cotton bales so tendered through the Clearing House since its establishment.

Year	F G M G Bengals	F G M G. Broach	Fine M G Oomras	F.G M.G Oomras	Good M G. Southerns	Total
1918-19 1919-20 1920-21 1921-22 1922-23 1924-25 1925-26 1926-27 1927-28 1928-29 1928-29 1931-32 1931-32 1932-33 1933-34 1934-35 1935-36 1935-36 1937-38 1937-38 1938-39	90,900 48,400 77,400 26,100 29,100 16,700 29,100 61,500 111,600 34,900 28,800 28,800 26,200 53,500 77,200 26,550 17,000 8,700	Bales 98,800 66,400 90,100 132,300 101,200 9,800 23,900 58,800 29,000 17,400 41,400 81,300 71,700 35,400 62,600 10,400 69,100 263,800 76,700 132,200 60,200 61,600	Bales 89,200 84,600 126,300 509,200 68,000 8,700 63,100 167,600 28,000 51,000 122,000 63,700 20,800 40,100 62,000 56,700 16,050 52,450 19,850 8,700 31,050	Bales 800	Bales 13,400 17,700 9,100 8,700 4,100 200 2,600	Bales 282,000 260,400 273,900 727,600 543,300 107,600 49,500 153,600 221,900 314,900 170,300 128,900 128,900 128,900 125,900 203,000 306,400 146,150 160,750 74,700 121,800

17. From the above table it will be seen that the largest quantity of cotton tendered during one season was in 1921-22, namely, 727,600 bales when the September and December-January Oomra corners were each responsible for the tendering of 144,600 bales and 211,800 bales, respectively, out of the 509,200 bales of Oomra cotton tendered during that season. The largest number of bales tendered during one delivery period was, however, during September 1922 when Messrs. Sangidas Jesiram's attempt to corner the September Oomra contract brought out tenders to the extent of 351,400 bales, the highest on record.

17A. The Clearing House since it started has worked very satisfactorily and without any hitch. It is quite true that, since the starting of the Clearing House, persons of modest means have been enabled to trade more freely as long as their cash resources permitted. The Clearing House has come to stay, and there is no demand from any section of the trade that it should be abolished. In fact, the demand has been that the fortnightly clearings may be made weekly clearings and as recently as the 26th March 1940 the East India Cotton Association amended their By-laws in order to introduce weekly clearings from 1st September 1940.

Hedge and Delivery Contracts

18. Another change introduced by the Cotton Contracts Committee has been the broadening of the Broach contract which, till then, permitted delivery only of Broach cotton, into a contract which permitted delivery of several other varieties. This broadening of the Hedge Contract has given rise to a good deal of controversy in the trade since then, and it has been revised twice or thrice without giving complete satisfaction to all the sections in the trade. The Millowners' Association started by asking for one hedge contract to permit delivery of all growths of cotton grown in India. This was summarily rejected by the vast majority of the trade as being an impossible proposition. Any effort at broadening the hedge contract has carried with it the suspicion that the motive behind it may be to deteriorate the hedge contract because more cotton could be tendered against it than could be comfortably financed by the growers and middlemen up-country and the trade in Bombay. An ideal hedge contract will always remain a subject of controversy, but judging by the experience of the last 20 years, it can be said that the hedge contract, as it exists to-day, although nowhere near the ideal, proves

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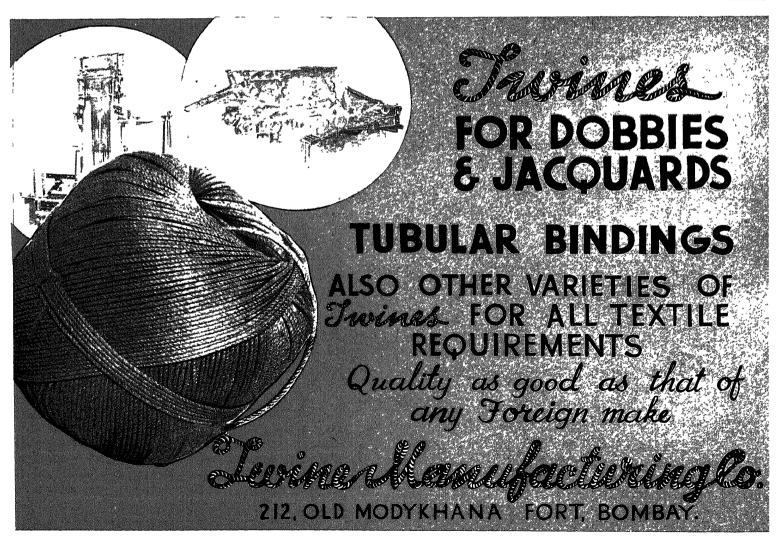
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in practice to be reasonably safe in the interest of the grower and the consumer. Whilst saying this, I should not be understood to imply that there is no room for improvement in the existing hedge contract, but there certainly is the greatest difficulty in getting an amendment which would meet with the approval of all sections.

19. With hedge contracts were introduced, what are called "delivery contracts," viz., contracts in any variety or growth which are supposed to be contracts meant specially to be delivered against and taken delivery of. No delivery orders can be passed on from one seller to another buyer, but by a convention, the trade has got round this in a practical manner, and whilst delivery orders are not passed, they do change hands, without physical passing on, by a commonsense method of action, to everybody concerned in the trade. As long as the trade works in the spirit in which this is managed it is not deemed advisable for the Association to take cognizance of such breach of the rule by agreement or rather convention based on moral understanding between members.

Shri Mahajan Association, Ltd., and the Indian Gotten Exchange, Ltd.

20. Whilst the East India Cotton Association and its predecessors as controlling bodies were in control of the cotton trade of Bombay, gambling in cotton rates was being carried on in what was known as the "Khandi Bazar," where the dealings were not in bales but in khandies (one khandi is equal to 2 bales). This was later organized under the title of "Shri Mahajan Association" which adopted, as nearly as was possible for them, as their basis some of the rules of the East India Cotton Association, and started transactions in Broach cotton, the main hedge contract of the East India Cotton Association. Their contract was for Broach cotton only as tenders, and this market almost worked on illicit trading by some members of the East India Cotton Association, in spite of prohibition by that Association. It became difficult to prevent this unless there was a definite complaint against any member and documentary proofs could be adduced. One of the complaints of the cotton trade was that if a person in the Mahajan Association made a profit, he escaped income-tax as no books were kept by members of the Mahajan Association and there was no record in the Mahajan Association of differences paid or received by their members. The unit of trading adopted by this Association was five bales, and whenever any question came up before the Legislature in Bombay, appeals were made in the names of the small operators and particularly, of cultivators who were supposed to have resorted to the Shri Mahajan Association to hedge their holdings. All this was, in fact, a put-up job, but it was difficult to alienate public sympathy from this body and it came to stay in spite of many efforts made to have its activities curbed. In fact, a third body actually started functioning in July 1932 under the name "The Indian Cotton Exchange," but it did not find even plausible ground on which to flourish.

Appointment of the Wiles Committee and Its Recommendations

21. In the year 1930, the Government of Bombay appointed a Committee under the chairmanship of

Sir Gilbert Wiles to examine and report on the best method of organizing forward trading in cotton in Bombay. The report of that Committee as regards representation on the Board of the East India Cotton Association was passed by a majority of 8 to 5 with a minute of dissent by Sir Ness Wadia. The following were the recommendations of that Committee:—

- (1) That a single association be given control of dealings in cotton and that the passing of contracts contravening by-laws drawn up by the Association and sanctioned by Government be made an offence punishable with fine; that all forward business be done through members of the Association and that the Act should prevent the formation of other associations for the control of forward business.
- (2) That the constitution of the Association be amended as under:—

Majority.

The Board of Directors to consist of 16 members, 4 each to represent Buyers and Sellers, 6 to be elected without reservation and 2 to be nominated to represent growers Election to be by the General Body, 1 member 1 vote

For the purpose of the first election existing panels I and 2 to be combined to form the Buyers' section, and panels 3, 4 and 5 to form the Sellers' section Thereafter candidates for election to be selected by a nominating committee The special representation of the buyers and sellers to cease after the sixth election after which there should be no reservation of seats.

Minority,

The Board to consist of 16 members, 4 each to represent Buyers and Sellers and 6 the Brokers Each section to be elected by the members of the existing panels combined as recommended in the majority report, the Brokers' panel remaining as at present. Two representatives of the growers to be nominated

- (3) That the present emergency powers of the Board (as laid down in by-law 52) be transferred to the General Body of the Association.
- (4) That the three existing hedge contracts be retained with the addition only of Kumpta and Upland growths of the Dharwar District to the Broach contract.
- (5) That forward trading be for single months throughout the year.
 - (6) That the unit of tender be 50 bales.
 - (7) That blind surveys be introduced at once.
- (8) That the Association should take power to establish bonded warehouses one year after the system of blind surveys has been introduced.
- (9) That there should be fixed trading hours for forward business.
- (10) That the power of the Board to close the market in a crisis be limited to three consecutive days.
- (11) That the Association should take over complete control of all forward trading both in the bazar and at Sewri, and provide a building in the bazaar as soon as possible. A Ring Committee be elected for the purpose of this control.
- (12) That fixing of differences between standard growths and between different grades be done by the



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Board themselves on the first day of each delivery period.

- (13) That fluctuations in prices in the forward market be regularly registered and published.
- (14) That Teji Mandi dealings be brought under control by the enforcement of cash premia and regular payment of differences through the Clearing House.
- (15) That steps be taken for the reduction of handling charges

All the above recommendations were adopted by Government with the exception of the majority recommendations relating to the constitution of the Association in which case Government adopted the minority recommendations.

- 22. As a result of these recommendations, the Board of the East India Cotton Association was added to by the nomination of two representatives of growers by the Indian Central Cotton Committee. With the passing of the Bombay Cotton Contracts Act of 1932 which replaced the Bombay Cotton Contracts Act of 1922, the representation of growers was enlarged and there are at present on the Board five such representatives, three nominated by the Indian Central Cotton Committee and two by the Government of Bombay.
- 23. One of the qualifications of an agricultural representative on the Board is that he should not "have dealings in forward contracts" and must be a grower of cotton, preferably as a worker on the field, if possible. In passing, it is only fair to say that the agriculturist representatives on the Board of the East India Cotton Association have, so far, proved themselves to be quite useful and have shown great earnestness in looking after the genuine interests of the cotton growers. There have been representatives on the Board from areas like Gujerat, Central Provinces, Punjab, Khandesh and Madras.

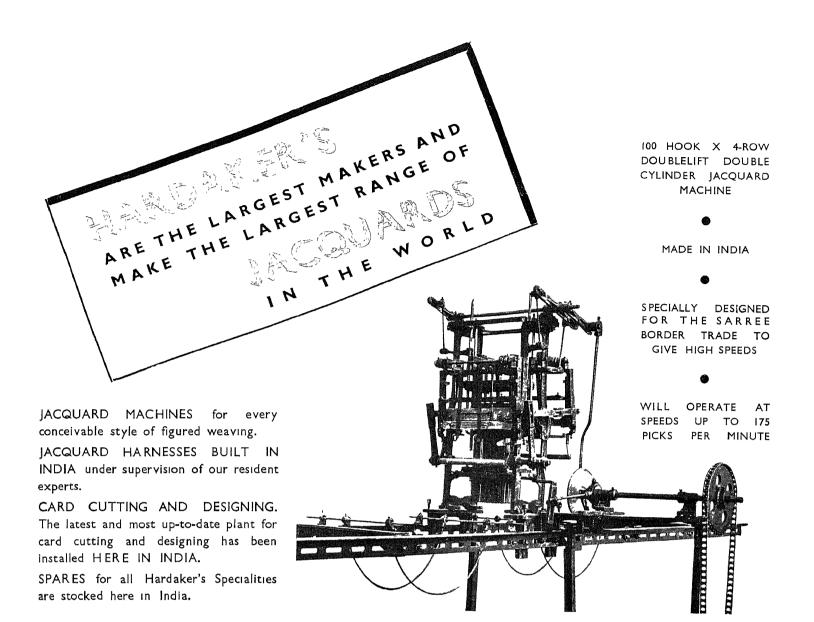
Options or Teji Mandi Transactions

24. Options or Teji Mandı transactions, which the Wiles Committee recommended should be brought under control, have for the past fifty years been a feature of the Bombay Cotton Market. They help the holding and carrying of cotton to later months by bringing into the cotton trade the resources of the small traders and merchants and this mass selling or buying acts as a brake on violent fluctuations in cotton prices. Incidentally, this large pooling of the resources of small men also helps to fetch better prices to the cotton grower. These transactions correspond to the "call" and "put" options of some foreign markets and their popularity and gradual enlargement prove their usefulness to the trade. In no other cotton market in the world is this trading done on so large a scale as in Bombay. In New York these transactions are prohibited, but in Liverpool, though they are not prohibited, the premia demanded are so high that the business becomes impracticable. In Bombay, option rates are on the whole cheap and attractive because of the peculiar genius of the few operators who "eat" Teji Mandi and this genius is a valuable asset to the cotton trade. Trading in options in the Bombay market is of yearly and monthly duration.

- 25. During the present emergency of the war in Europe, trading in options in the Bombay market has been banned but it is almost certain that, when the ban is removed, it will revive, as it is a characteristic of the market and provides valuable price insurance facilities for traders in actual cotton and limits the risk of the speculator.
- 26. An option may be described as the purchase of a right to buy or sell cotton at some time in the future when a fall or rise in the market price makes it profitable for the buyer of the option to do so. A teji or "call" option is an option to buy. A mandi or "put" option covers the right to sell. A Teji-Mandi or double option gives the buyer the right to buy or sell as the market may suit him. A buyer of an option is known as the "applier" and the seller of an option the "eater." A teji or mandi option can be effected in the following manner:—

If a person is confident of a rise or fall in the cotton market, in consideration of a certain payment to the seller (the eater) of the option, called the premium, he buys (applies) an option to purchase or sell at a certain rate on a fixed future date a certain quantity of cotton. For example, "A" for a consideration of a payment of Rs. 8 premium buys to-day a teji option, i.e., a right to buy, 100 bales of Broach, April-May, at Rs. 180. He stands to gain as the market rises, and by selling an equal quantity of cotton in the market at any time, he secures a profit. If the price movement is not favourable to him, i.e., the price does not rise after he applied teji, his only loss in that case is limited to the amount of Rs 8 he paid as premium to purchase the right to buy. Similarly, if he applies mandi, i.e., the right to sell the above 100 bales and the price does not decline as anticipated, his loss is again limited to Rs. 8 paid as premium and nothing more. In Teji/Mandi or double options the buyer, as stated before, purchases the right to buy or sell as the market suits him at a premium which is double that of teji or mandi. Let us take this illustration. In October 1939, "A" buys or applies '' teji mandi'' at Rs. 180 per candy for Broach Aprıl-May settlement, which terminates on 24th March 1940, and pays the seller of the option or "eater" Rs. 16 per candy premium or Rs. 800 on 100 bales. If in December, he finds that the market has dropped to Rs. 155, he buys at this rate against his basic rate of Rs. 180. Should the market later on register a rise, say, to Rs. 200, he makes a sale at this price and appropriates it against his open purchase at Rs. 155 and leaves his option open, thus making a profit of Rs. 45 per candy or Rs. 2,250 on 100 bales. But should the market not rise on the due date, i.e., on the 24th March 1940, further than his basic rate of Rs. 180, his purchase at Rs. 155 and basic rate at Rs. 180 are squared and after deducting Rs. 16 paid as premium, he makes a profit of Rs. 9 per candy or Rs. 450 on 100 bales (Rs. 180—Rs. 155— Rs. 25—Rs. 16 =Rs. 9 per candy ×50 candies=Rs. 450).

27. From the above it will be seen that though "A" can exercise his right of option only on the due date, he can operate upon his Teji Mandi transaction on the assumption of having a sale whenever prices are lower than his mandi rate and a purchase whenever prices are higher; thus between October 1939 and March 1940 "A" can buy below Rs. 180 and sell above Rs. 180 as many times as he chooses to do and the most he can lose is the premium of Rs. 16 (Continued on p. 303)





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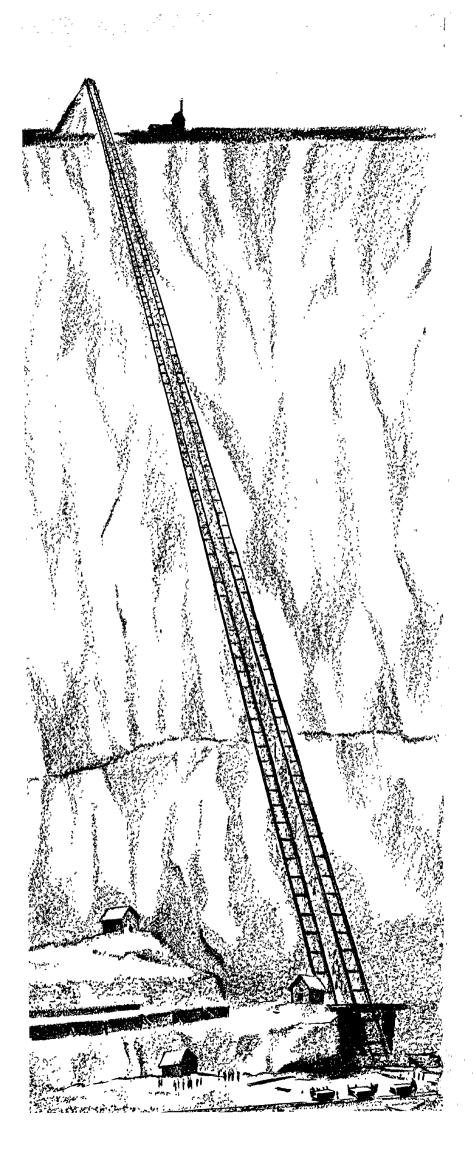
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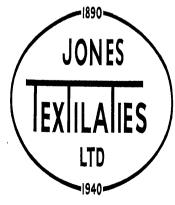
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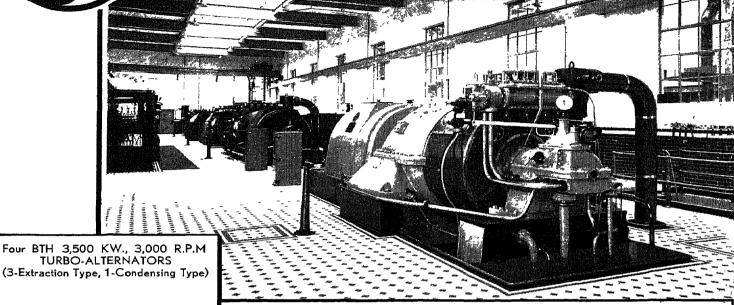


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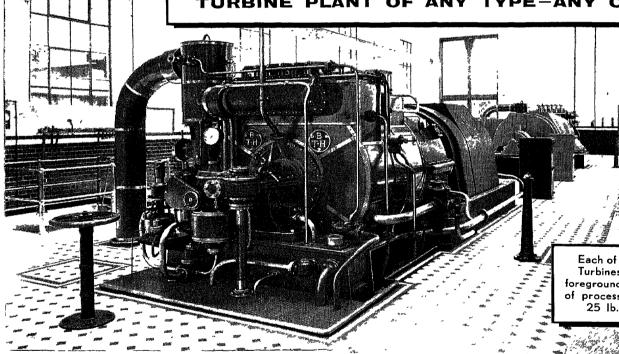


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Evolution of Cotton Trade—(Continued from p. 297)

which he has paid to the "eater," if, on the due date, the price should come back to Rs. 180. The maximum loss thus being fixed, "A" by skilful trading in the ups and downs of the market can make handsome profits.

28. There are also certain option transactions known as Teji Mandi gali transactions by which are meant options above and below the current prices quoted in the market, and the premia for such transactions are smaller than those prevailing for ordinary Teji and/or Mandi transactions. In such transactions, if the price ruling in the market is Rs. 180 and if "A" anticipates a big rise but is not willing to go in for an outright purchase or even risk so much as Rs. 8 per candy premium, he applies teji at Rs. 200, i.e., Rs. 20 above the current ruling price by paying a smaller premium of, say, Rs. 4 per candy. Subsequent operations are carried on in the manner indicated above with the only difference that the purchase accruing to him on option account is at Rs. 200 and not at Rs. 180. He then operates freely by selling above Rs. 200 and covering on declines.

Regulation of Option Business

29. About the year 1934, the Board of the East India Cotton Association, in accordance with the recommendations of the Wiles Committee in the matter of option business which was conducted in the forward market in Bombay without regulations, submitted to the Government of Bombay amendments of the by-laws of the Association enabling the Board to control option business. These by-laws were passed by the Association at an extraordinary general meeting and the Government of Bombay consulted various commercial bodies before deciding to give their sanction to them. Some opposition having been voiced from certain quarters, an informal reference of these by-laws was made to the Government of India by the President of the Indian Central Cotton Committee. A conference was held at Delhi in 1935 between the Secretaries of the Commerce and Finance Departments of the Government of India, the President of the Indian Central Cotton Committee -Sir Bryce Burt—and the President of the Association. The Secretaries of the Commerce and Finance Departments, by a demi-official letter to the Secretary, Finance Department of the Government of Bombay, recommended sanction of certain portions of the by-laws regarding option business as passed by the East India Cotton Association, but no action has been taken on these by-laws till now.

Blind Surveys and Appeals

30. Another recommendation of the Wiles Committee was that the East India Cotton Association should introduce a system of Blind Surveys in place of the existing system which was found to be working unsatisfactorily. In 1937 the East India Cotton Association adopted this system of surveys and appeals and made it applicable to cotton tendered against 1937-38 season crop contracts and thereafter. The first survey under the new system was held on 20th October 1937 and the first appeal on 22nd October 1937. Under the old system of surveys each of the two parties nominated its own surveyors and some of these, instead of acting as assessors, acted as advocates with the result that their awards excited mistrust in the system, particularly by up-country traders. Under the new system, instead of the parties

appointing their own surveyors, the surveys are held by persons who are not aware of the names of the parties to the dispute and the human element complained of in the old system of surveys has been appreciably minimized. Soon after the commencement of the Association's official year, the Directors appoint a Survey Committee of not more than 25 persons from among the members of the Association and their authorized and nominated representatives. This Committee is divided by the Secretary of the Association into five panels of five persons each by drawing lots, and the day or days on which the members of such panels are to act are also determined by the Secretary by drawing lots. The results of the draws are kept secret and the surveyors are only informed of their turn to act on the day itself. The five members of a panel enter upon their work of survey by twos under the direction of a chairman appointed by them, and if they differ as to their award, the Chairman appoints any one of the remaining surveyors, of the panel or himself, if he is not one of the differing surveyors, as an umpire. The award of the surveyors or umpire is subject to a right of appeal to the Appeal Committee.

The Appeal Committee consists of 16 persons also appointed by the Directors soon after the commencement of the Association's official year, and as in the case of the Survey Committee, is divided by the Secretary into two panels of seven persons each by drawing lots and each of such panels is to dispose of appeals on one day only. No member of the Appeal Committee can be a member of the Survey Committee.

Unitary Control of the Cotton Market

- 31. The Board of the East India Cotton Association decided in May 1935 to recommend to the Government of Bombay that they should be vested with unitary control of forward trading in cotton in Bombay as they felt that, without this power vested in them, they could neither effectively control the cotton market nor introduce some amendments in the system at present prevailing One of the agriculturist directors of the East India Cotton Association, Sardar Rao Bahadur Bhimbhai R. Naik, in his personal capacity, actually tabled a Bill amending the Cotton Contracts Act in September of the same year, but the Bill met with opposition from certain quarters and the Government of Bombay were unwilling to give it the support which might have ensured its smooth passage through the Assembly. This Bill, was, however, ultimately withdrawn by the mover in September, 1936, as he felt that it would not be possible to carry the Bill through its various stages before the dissolution of the then Legislative Council, it being its last session.
- 32. When the Congress Ministry assumed office in September 1937, they turned their attention to introducing effective regulation of forward trading in cotton, and various conferences were held between the Hon'ble Minister in charge and representatives of the East India Cotton Association and the Shri Mahajan Association. Finally, in June 1939, the following Press communique was issued jointly by the East India Cotton Association and the Shri Mahajan Association:—
- "The Government of Bombay intimated to the East India Cotton Association Limited and the Shri Mahajan Association Limited, in June 1938, certain

proposals which they were inclined to suggest as a fair compromise between the views of the East India Cotton Association and the Shri Mahajan Association Limited, and requested that representatives of both the Associations should meet and adjust their differences among themselves even if their proposals involved modifications to some extent. The proposals were:—

- 1. That a Ring be created for the smaller trader to operate with a unit of 10 bales.
- 2. That operations in the small ring be restricted to trading in a maximum unit of 2,000 bales for each settlement.
- 3. That members operating in the small ring be required to pay a deposit of Rs. 3,000 or so (inclusive of their existing deposit with the Shri Mahajan Association).
- 4. That members trading in the small ring be allowed to select two representatives to the Board of the East India Cotton Association.

The Board of the East India Cotton Association thereupon authorized their President, Sir Purshotamdas Thakurdas, Kt., to carry on negotiations with representatives of the Shri Mahajan Association Limited, who met him on the 12th September 1938 for the purpose, but the negotiations fell through as no unanimity could be reached in regard to proposals Nos. 2 and 4 and, moreover, some points were raised which required clarification. Another attempt was made towards the end of December 1938 for the solution of difficulties that came in the way of an agreement being reached between the two bodies, which also did not succeed as differences on proposal No. 4 could not be wiped off entirely.

The Government again suggested, in May 1939, that further efforts be made towards bridging the remaining differences, if possible. Consequently, further discussions ensued as a result of which an agreement has been reached between the two bodies whereby the Shri Mahajan Association have agreed to amalgamate with the East India Cotton Association on the following terms and conditions:—

- 1. Membership—That the members of the Shri Mahajan Association shall be permitted to join the East India Cotton Association within two years of the amalgamation and be admitted to a special class of membership to be created by the latter who shall take in such members or approved nominees of theirs (these nominees to be approved by the Board). The annual subscription for such members shall be Rs. 50 but it shall be reduced to Rs. 25 in the case of sleeping members during these two years after which all members shall pay Rs. 50.
- 2. Deposit—That those who may join this special class of membership shall pay a deposit of Rs. 2,500 to the East India Cotton Association on which interest at the rate of 3 per cent shall be allowed (as at present allowed to members of the E. I. C. A.).
- 3. Unit of Trading.—That this special class of members shall be permitted to trade in units of 20

bales. However, in order to effect saving in handling charges and to facilitate the work of passing on of delivery orders and taking delivery of cotton, if the contracts be for 50 bales or in excess of 50 bales or in multiples of 50 bales, delivery orders shall be issued for 50 bales only and for balances of less than 50 bales delivery orders shall be issued for 20 bales. The East India Cotton Association shall permit issuing of delivery orders in the smaller unit on the first three tender days of a delivery period, after which delivery orders in units of 50 bales only shall be allowed. This involves that no fresh trading in units smaller than 50 bales is permissible after the beginning of a delivery period.

- 4. Trading Ring.—That no separate Trading Ring shall be provided for trading in the smaller unit but members of this special class shall be permitted to trade in the same ring with members of the East India Cotton Association in units of 20 bales or 50 bales as may be convenient to them. In the event of any party asking for havalas from members of this special class in respect of their business they shall forthwith give havalas of full members of E. I. C. A., as is customary in the E. I. C. A. at present.
- 5. Settlement Clearing and Teji-Mandi Business.—That the settlement clearings shall be uniform as in E. I. C. A. at present. Regulations in Teji Mandi, as may be approved by Government, to be applicable to all members.
- 6. Representations on the Board and on the Ring Committee.—That this special class of members shall be entitled to elect three of their representatives to serve on the Board of Directors of the E. I. C. A. This special class to which members of the Shri Mahajan Association are to be admitted shall also include existing associate members of the E. I. C. A., candidates whose applications for such membership may have been received by the E. I. C. A. upto 15th June 1939, and which may be approved of by the Board, and partners of full members of the E. I. C. A., who may wish to apply for this special class of membership during these two years. During these two years no other new members were to be admitted to this special class of members.

That this special class of members shall also be entitled to return to the Ring Committee of the E. I. C. A. a certain number of their members in proportion to their number of Directors on the Board.

- 7. Right of Voting at General Meetings.—That nine per cent. of this special class of members on the roll of the E. I. C. A., from time to time shall have the right to be present and vote at general meetings of the East India Cotton Association.
- 8. General.—That the settlement agreed upon in the matters of annual subscription, amount of deposit, unit of trading, viz., 20 bales, and representation on the Board, shall not be altered without the consent of this special class of members.
- 33. The members of the Shri Mahajan Association having subsequently not confirmed the above terms and conditions of amalgamation in a general meeting, no further progress could be made in the matter. However, on the outbreak of war in September 1939, the

Government of Bombay considered it essential to bring about unity of control in the cotton trade in order to minimize the effects of excessive speculative operations attendant on the war and the Government in due course drafted a Bill for the consideration of the Legislative Assembly whereby they proposed to vest such control in the East India Cotton Association Limited.

34. The Ministry having, however, resigned on lst November 1939, this Bill could not be brought up for the consideration of the Legislature.

Reduction in Handling Charges

- 35. In the early days, a custom prevailed of allowing a discount of $5\frac{1}{2}$ per cent. on all sales of actual cotton. There was also a smaller discount of $3\frac{1}{2}$ per cent. for half-pressed bales to offset dearer freight charges. As the calculation of these discounts was merely a matter of arithmetic and did not in fact affect the net price of the cotton but gave the appearance of an addition to the handling charges in Bombay, the custom of allowing such discounts was discontinued about twenty years back. About the same time the custom of buying on "office terms" was also discontinued. Office terms were a relic of the days when the greater part of the cotton exports was handled by European firms rather than Indian firms, many of whom preferred to buy their cotton net of all allowances, i.e., excluding brokerage, muccadum allowance, charity allowance, etc.
- 36. The question of reducing handling charges continued to receive the close attention of the cotton trade and several representations were made to the authorities concerned to reduce railway freights, dock charges, etc. As a result of these representations, the Bombay Port Trust in 1933 reduced the wharfage on raw cotton brought by country craft from West Coast ports to Bombay from six annas to two annas per bale and with effect from 1st April 1934 the non-refundable town duty of Re. 1 per bale on imports of Indian cotton into Bombay by sea or land was abolished by the Government of Bombay, as the hardships of the said duty on the city of Bombay and the cotton trade, during the 13 years of its existence, were unmistakably perceptible by the diversion of the cotton trade from Bombay to cheaper ports and markets The thanks of the trade for the abolition of this duty, which was imposed by Government in 1920 for the purpose of providing funds for the improvement and development of the Bombay suburban revenue and the provision of tenements for the working classes of the city of Bombay, are due to the late Lord Brabourne, who realizing the harm that was being done, took steps to abolish it soon after his assumption of the office of Governorship of Bombay. Simultaneously with the abolition of the town duty, reductions were also made in railway freights and dock charges by the two railways in Bombay and by the Bombay Port Trust. In order to further reduce the scale of charges for handling cotton in Bombay so that the Bombay Cotton Market may compete with other cheaper ports and markets to which cotton had been diverted for transit or for marketing purposes, the East India Cotton Association in 1935 abolished the muccadum allowance of eight annas per bale, payable by the seller to the buyer, and also reduced the brokerage on ready purchases of cotton from $\frac{1}{2}$ per cent.

to $\frac{1}{4}$ per cent. In 1936, repressing charges payable by the seller to the buyer on all burst bales were reduced from Rs. 3 to Rs. 2 per bale and interest on settlement accounts was to be calculated at $4\frac{1}{2}$ per cent. instead of at 6 per cent. For dealings in 1940-41 contracts and thereafter no interest is to be calculated. In 1937 the prevalent custom of receiving and paying "Bazar Dhara brokerage," which was not the same as brokerage between a broker and his constituent, ceased to exist. These and other reductions such as reductions ın godown and jaitha rents at Sewri, fire insurance rates, etc., which the East India Cotton Association is continuously pressing for will, it is hoped, increase the receipts of cotton into Bombay and place its cotton market on an equal footing with those cotton markets in India where the cost of handling cotton is cheaper. The cotton trade of Bombay is convinced that, where a market is a distributing market or a port is a port of transit such as Bombay, any charge put on commodities passing through that port or market militates against the turnover at that port or market to the ultimate detriment of the producer of that commodity.

Labour Welfare and Organization

- 37. In its evolution, the cotton trade, while establishing an organized cotton market in Bombay, has not forgotten or neglected labour. For the benefit of labourers and others employed on the Cotton Green, the Bombay Cotton Merchants' and Muccadums' Association Limited maintains a charitable dispensary at the Cotton Depot, Sewri. The Bombay Presidency Infant Welfare Society has also a centre at the depot towards which the trade donates yearly Rs. 3,000. Three Trust Funds, namely, the Cotton Servants' Relief Fund (amounting to about Rs. 25,000), the Maneckjee Merwanjee Nanpuria Trust Fund (amounting to about Rs. 25,000) and the Seth Shivnarayan Nemani Charitable Trust Fund (amounting to Rs. 1.01,000) are administered by the East India Cotton Association, the first two for the benefit of those employed at the Cotton Depot and the third for the benefit of all persons engaged in the cotton trade. There is also a night school for labourers conducted under the auspices of the East India Cotton Association in the Cotton Green Building of the Association at Sewri as well as a library and reading room managed by the Committee of Management of the Cotton Servants' Relief Fund. Recently a co-operative credit society has been started at Sewri to encourage thrift amongst labourers.
- 38. In November 1937, owing to labour unrest at the Cotton Depot, Sewri, the Government of Bombay instituted inquiries regarding the then prevailing labour conditions there. With a view to satisfying the Government of Bombay that the cotton trade was always ready to do full justice to the labourers employed on the Cotton Green, the East India Cotton Association intimated to Government its willingness, with the support of Government, to organize proper administration of labour conditions on the Green and suggested certain measures for the protection of labourers employed there. The Government of Bombay having approved of the measures suggested, the Association appointed a Labour Officer with effect from 1st November 1938 to carry out the organization work on the lines agreed to between the Government of Bombay and the Association. The Association also prescribed rules for the administration of labour enagaged by the trade, appointed a Labour Supervision Committee as required under the Rules and fixed the minimum wages for various kinds of

Cotton Depot unless he has deposited with the Association a sum equal to the average monthly wages payable by him to his employees as safeguard against his eventual failure to pay them Each contractor is required to possess a licence and 60 licences have been issued so far. Hours of work are regulated and provisions are made for allowance for overtime work Insurance of liability under Workmen's Compensation Act has been made compulsory and in addition to compensation, permanent hands are also given wages for the first seven days after the accident for which there is no liability to pay under the Act. The benefits of the provisions of the Maternity Benefit Act are extended to female workers after an approved service of one year and child labour is prohibited In deserving cases old workers who have no means of livelihood are provided with small pensions from the funds of the Cotton Dealers' Association and workers in distress due to unemployment or prolonged illness are given help from the Cotton Servants' Relief Fund A co-operative society has been started to encourage thrift amongst workers and to lend money at moderate rates of interest. The benefit derived by workers from the Society by way of reduction in interest and regular payments amounted approximately to Rs. 10,000 in 1939-40. Facilities are granted to workers for the celebration of religious festivals in the hall devised for use as Trading Hall when the afternoon session of forward trading was held at Sewri, and recently a temple has been built near the Exchange Building, in memory of the late Seth Shivnarayan Nemani, by the well-known Nemani firm. Direct contact with labour is maintained through the Labour Office and during the last two years 207 disputes and complaints regarding non-payment of wages to labourers by contractors, enforcement of the scale of minimum wages, payment of allowance for overtime work, dismissals without notice, etc., were settled, and labourers got their dues and their grievances were redressed. The beneficial results of the administration of labour as above have been appreciated both by labourers and merchants

labour. No labour contractor is allowed to work in the

The Abode of the Gotton Trade

- 39. As mentioned before, the abode of the cotton trade was shifted from place to place during its evolution and to-day it is housed in two magnificent buildings erected at Sewri and at Marwari Bazar. The one at Sewri, with the cotton warehouses and storage ground around it, accommodates business in spot or ready cotton while the one at Marwari Bazar accommodates the forward market. The cost of these two buildings is approximately Rs. 36 lakhs. Prior to its removal from Colaba to Sewri in November 1923, the cotton trade was accommodated there in buildings owned by the Bombay Cotton Trade Association Limited and the Bombay Cotton Exchange Ltd.
- 40. Bombay is the largest cotton market in Asia and half the Indian cotton crop, which is the second largest in the world, is marketed through Bombay. In a normal season about three million bales of cotton arrive in Bombay out of which about two millions are exported and the balance consumed by Bombay mills. These figures serve to show that Bombay is not only an immense "spot market" or distributing centre, but also a consuming centre of first class importance, and it would be surprising if such a market were not to possess facilities for trading in "futures." It may be

claimed for Bombay that its average daily turnover in "futures" compares with that of any other market in the world. New York is the dominant market and on occasions the turnover there augmented by executions on behalf of India exceeds anything experienced in Bombay; but Bombay is perhaps the broader market.

- 41 In conclusion, it may be said that Bombay today possesses a well-organized cotton market and with the facilities it provides for the marketing, distribution and storage of cotton, it offers the maximum in service, economy and protection.
- 42. In recent years operators outside India have traded to a larger extent than before in the Bombay market, but it is still felt that there is considerable room for the expansion of such foreign business and with cotton trading organized and controlled as it now is, on the lines which afford complete protection to those operating in the market, it is hoped that cotton traders in other countries will make greater use of the facilities afforded by Bombay.
- 43. All such activity on the Bombay Cotton market is bound to conduce to better returns for Indian cotton, provided the control is unitary and conceived and carried out without fear or favour.

Trade Treaties and Pacts—(Concluded from p. 25)

this matter. It may, however, be mentioned that non-official advisers were given to understand that the offtake of a reasonable quantity of cotton will be guaranteed. Such a development would obviously safeguard the position of the Indian Cotton growers, and could act as a recompense for any sacrifices that the Indian textile industry might be called upon to make. They, therefore, recommended to the Government that in the event of Lancashire agreeing to make a guaranteed purchase of $6\frac{1}{2}$ lakhs bales of Indian Cotton per year, with definite allocations between long and short staple varieties, they would consider it a sufficient basis for a favourable consideration of the claims of Lancashire.

During the course of the subsequent negotiations, however, the question of "guaranteed purchase" was gradually permitted to recede into the background, and the agreement, as it emerged, only provided for a gradual offtake of Indian Cotton by Lancashire, with an ultimate objective of 6 lakhs bales a year. There were no guarantees for this purchase, nor was there any stipulation for the purchase of particular types of Indian cotton. On the other hand the concessions granted to Lancashire by way of a reduction of the duties on the imports of piecegoods were definite and immediate. So far as the other parts of the agreement were concerned, they were equitable to us. For instance, the unpopular supplementary agreement was dropped and the range of Indian exports receiving preferences in the U. K. was extended while the similar range from the U. K. was curtailed. But considering the agreement as a whole, it could not be said that we succeeded in securing a sufficient quid pro quo for our sacrifices. In fact the latter appear to be not only large but also unnecessary. Once again, therefore, the negotiations and the agreement proved that in economic as in political matters the bigger partner has always a stronger hand.

Indian Gotton Textile Industry—(Continued from p. 19)

adopted by the mills, and any serious expansion of mill activity was out of the question. For nursing the mills in these initial stages, the agents, who were also the promoters, received a commission at the rate of a quarter of an anna per lb. of yarn produced. This was in the period 1854-85. Commission worked at this rate yielded only a few thousand rupees annually as the mule and fly throstle working in those days yielded only a third of the production obtainable on ring spinning which came into being later on. With the advent of ring spinning in about 1886, the basis of remuneration was changed to a percentage on profits, and the first firm of managing agents to adopt it in Bombay was Messrs. Greaves Cotton & Co., though the same system had been adopted by Mr. J N. Tata in Nagpur a few years previously. Other mills followed, but 17 mills still continued on the old basis.

The prosperous days of 1875 to 1890 attracted investors. Cotton merchants, coal and store suppliers and machinery merchants, all were willing to come to the help of the mill promoter. The last mentioned particularly supplied machinery on easy payment terms.

The trade depression, however, which started after the closure of the Mint in 1893, witnessed the closure or liquidation of some agency concerns also, and as a result agencies changed hands

The managing agents had very difficult times in the period 1893-1903. Depression in trade kept away investors, and the managing agents had the double task of financing extension and providing funds for the day-to-day expenses of their mills. The situation, however, improved immediately after the commencement of the war of 1914, and the large profits which were obtainable in those days once again attracted investors. Share values soared to very great heights, and public deposits were for a time freely available at a reasonable rate of interest. In the war and the immediate post-war years, there was very little change in the basis of selling agents' remuneration, which was 10 per cent. on profits in the majority of cases in Bombay and about a quarter of an anna per lb. of yarn in others. It must, however, be mentioned that another basis of remunerating managing agents came into voque in this period, mostly in up-country centres, viz., to remunerate them on the basis of sales.

The method of remunerating agents on the basis of sales or production did not find favour with the first Tariff Board, and to satisfy public opinion, the question was taken up seriously by Bombay mill agents, and by about 1932 all mills except three or four had adopted a system of remunerating their agents on the basis of a percentage of profits, which undoubtedly is the fairest method of all. The Indian Companies Act was amended in 1935, and the new Act prohibits the remuneration of managing agents on any basis other than a fixed percentage on annual net profits except with the previous sanction of shareholders. In this connection, it may be added that the basis of commission in Ahmedabad is still on sales or production.

With the commencement of the post-war trade depression which set in in 1924, the managing agents' difficulties again increased. Losses sustained by cotton mills undermined public confidence. Banks refused to advance money to mills except on the basis of a joint pronote signed by the managing agent. This kind of relationship between the managing agent and the mill in a period of depression was none too pleasant for the former and involved a severe strain on his resources. In the period 1926 to 1935, the managing agencies of

Bombay mills alone made the following sacrifices on behalf of the mills under their charge:—

- (2) Amount of interest on loans to mills given up by managing agents during this period 1,09,67,973
- (3) Amount of loans advanced by managing agents and converted into capital during this period .. 2,80,78,750
- (4) Losses incurred by managing agents through guaranteeing loans to mills from Banks 74,99,228

Besides this, mill agents in Ahmedabad also gave up from their commission during this period, a sum of Rs. 1,24,50,000.

The Indian Banking Enquiry Committee went into the question of mill finance, and found that in Bombay the position was roughly as under:—

- 21 per cent. of total finance came from loans by managing agents.
 - 9 per cent. of total finance came from loans by banks.
- ll per cent. of total finance came from public deposits.
- 49 per cent. of total finance came from share capital. 10 per cent. of total finance came from debentures.

It has since been ascertained that more than 50 per cent. of the share capital and about 20 per cent. of the debentures are held by managing agents. The advances from banks and public deposits are there on the guarantee of the managing agents. All these bring out clearly the services rendered and the risk undertaken by the managing agent in running the mills.

Manufactures of the Indian Mill Industry

The following figures show the composition of the Indian industry's manufacture at ten-year intervals from the year 1909-10:—

Production of Yarn
(In million lbs.)

					All I	India			Bomba	ay City	
	Cou	nt		1909- 10	1919- 20	1929- 30	1939- 40	1909-	1919- 20	1929- 30	1939- 40
1-10s 11-20s 21-30s 31-40s Over 40s Wastes		::	 ::	135 353 119 16 4	84 347 183 17 4	105 388 272 46 15 7	123 545 311 157 82 15	93 176 55 4 1 	56 173 81 5 1	53 106 86 13 5 1	30 92 94 48 25 1

The above figures show that between 1929-30 and 1939-40, substantial progress has been made in the direction of spinning fine count yarn in this country. Diversification of production, especially in the direction of producing fine goods, was one of the remedial measures recommended by the Noyce Tariff Board for adoption in Bombay mills, and the above figures bear out the contention that the Bombay industry has done its best to carry it out. A lot still remains to be done, but the duty of one anna per lb. on long-staple cotton which mills have now to pay is a factor which is likely to make further progress in this direction very difficult if not impossible.

A similar progress is also noticeable in the manufacture of fine count piecegoods, as from the following table it will be noticed that the production of fine *dhutis*, cambrics and lawns, and fine longcloth has gone up:—

Production of Cotton Piecegoods

(In million yards)

	All India				Bombay City			
	1909- 10	1919- 20	1929- 30	1939- 40	1909- 10	1919- 20	1929- 30	1939- 40
Grey and Bleached Piecegoods Chadars Dhuts Drills and Jeans Cambrics and Lawns Printers Shirtings and Longcloth T-cloth, domestics and sheetings Tent cloth Khadi, Dungri or Khaddar Other sorts Coloured Piecegoods	51 249 22 4 33 245	68 338 81 8 30 444 122 6 67 476	66 776 100 3 19 585 91 8 125 41 604	71 1,230 122 188 17 1,011 173 26 103 144 926	35 57 10 2 173 102 1 5 145	29 79 50 4 256 83 3	20 171 56 1 289 26 2 36 15 273	11 369 51 64 420 48 2 32 243
Total	964	1,640	2,419	4,012	532	863	889	1,242

The figures do not bring out the total quantity of goods actually bleached by mills. Before the 1932 Tariff Board, the millowners of Bombay produced figures to show that 20 per cent. of their goods were bleached. The proportion is much higher in Ahmedabad, but decidedly lower in certain other centres. The official statistics of production do not specify the total output of printed goods. There are to-day 7 mills in Bombay with 15 printing machines. In Ahmedabad, the number of printing machines is understood to be 13 in 10 mills.

The Market for Indian Mill-made Cotton Yarn and Piecegoods

The following figures show the total quantity of mill-made cotton yarn and piecegoods available for consumption in this country .—

Cotton Yarn

(In million lbs.)

	1909-10	1919-20	1929-30	1939-40
Production of Indian mill-made yarn less exports Imports less re-exports	393 34	475 8	802 44	1,207 41
Total Estimated quantity of yarn con-	428	483	846	1,248
sumed in Indian mills Balance of yarn available for	204	342	502	784
consumption in the country for handlooms		141	344	464

Cotton Piecegoods

(In million yards)

	1909-10	1919-20	1929-30	1939-40
Production in Indian mills less exports	837 2,070	1,401 936 2,337	2,200 1,808	3,790 485
	4,901	4,331	4,008	4,275

In 1909-10, foreign importers supplied 15 per cent. of the yarn available for consumption in the country to the handlooms; to-day their share is only 8.8 per cent. Similarly the share of other countries in piecegoods, which was 71.2 per cent. in 1909-10, is to-day only 11.3 per cent. The above figures do not include the production of handlooms. No special statistics relating to the production of handlooms are available, but if an

estimate is made on the basis of the yearn available for consumption in the country, we get the following results:—

	1909-10	1919-20	1929-30	1939-40
Estimated production of cloth on handlooms (millions of yds)	1,071	674	1,679	2,365

Therefore, inclusive of the handloom production, the total estimated consumption of the country (in millions of yards) would be as under:—

Yea	r		Total cotton piecegoods	Imports of art silk piecegoods less re-exports	Total estimated consumption of cloth
1909-10 1919-20 1929-30 1939-40	••	•	3,978 3,011 5,687 6,640	57 61	3,978 3,011 5,744 6,701

Export Markets

The following table shows the total exports of cotton yarn and piecegoods from India:

	Year	[:	Cotton yarn (million lbs)	Cotton piecegoods (million yards)
1909-10 1919-20 1929-30 1939-40	••	 •	227 152 24 22	94 196 133 111

The principal markets for Indian manufactures since 1909-10, and the exports to those markets are shown below:—

Cotton Yarn

(In million lbs.)

	1909-10	1919-20	1929-30	1939-40
Hongkong	84 116 5	60 67 4	ı i	5

Cotton Piecegoods (In million yards)

		1909-10	1919-20	1929-30	1939-40
Aden Straits Settlements Kenya Colony Turkey Persia Siam China Egypt Portuguese East Af	rıca	10 11 3 11 10 3 6 2	15 20 10 52 34 6 1	4 18 8 19 2 1	2 23 3 2 7

The Government of India Trade Mission which visited Iraq, Iran, Egypt, East Africa, etc., in 1927-28, expressed the view that Indian mills might be able to secure an additional market to the extent of an additional 100 million yards. Since then, the position has changed. Japan entered the markets in right earnest, and was able to make headway at the expense of Indian and United Kingdom manufactures, the depreciated Japanese currency conferring an advantage on Japanese manufactures in these markets. Then followed the Imperial Economic Conference as a result of which various parts of the Commonwealth and even foreign countries like Egypt, Persia and Iran instituted special

tariff measures including discriminating duties and a quota against Japan. This, to a certain extent, overcame Japanese competition in foreign markets, but the position of Indian mills in those markets is still unsatisfactory for the reason that Indian mills have to pay a duty of one anna per lb. on imported raw cotton and a 10 per cent. duty on imported millstores and dyestuffs. Still enough has not been done in this direction, and it would be well for Bombay mills to devote greater attention to this problem

Imports of Cotton Piecegoods and Yarn

The following statement shows the total imports of cotton yarn and piecegoods into British India from 1909:—

Cotton Yarn (In million lbs)

		1909-10	1919-20	1929-30	1939-40
United Kingo China Japan	lom 	 36.6	12.2 0.2 1 9	20 1 10 6 10 9	2 8 10 8 27.2
	Total	 40 3	15.1	43 9	41 1

Cotton Piecegoods (In million yards)

			 1909-10	1919-20	1929-30	1939-40
United Ki Japan Holland Italy U.S A	ingdo	om	 2,140 9 23 0 3 7 9 7	976 1 75 9 7 7 1 4 9 6	1,247 5 562 0 21 7 25.4 33 0	144 5 393 4 0 7 0 8 0 5
		Total	 2,192.7	1,080 7	1,919.3	579

The following table brings out clearly the progress made by Japan and China in the Indian market in the years 1923 to 1934, when effective action was taken against Japan .—

		Ya	arn	Cotton piecegoods		
		Japan	China	Japan	China	
		(Mıllıo	n lbs)	(Mıllıon yards)		
1923-24 1924-25 1925-26 1926-27 1927-28 1929-30 1929-30 1930-31 1931-32 1932-33 1933-34		20 4 32.3 33.5 26.6 17 0 7 6 10 9 6.2 18 1 11 7	0 1 0.4 0.9 12 9 11 4 10 6 11 7 13 2 13 3 10 2	122.7 155 3 216 8 243 6 323 1 357 3 562 0 320 8 339 8 579.7 349.0	6 1 4.9 2 3 1 9 7 0 13 4 9.7 2 5 4 0 0.7 0 2	

What would have happened to the Indian industry if protection had not been granted may be better imagined than expressed.

However, it should not be presumed that the existing Indian tariff is effective or foolproof against these countries. The abolition of the minimum specific duty on counts above 50s where a very high level of protection is really necessary has recently switched over Japanese and Chinese imports of yarn into these counts. The inadequacy of protection in these counts coupled with an import duty of one anna per lb. on imported staple cotton payable in this country has greatly accentuated the difficulties of Indian mills. Another factor is the Japanese occupation of parts of China which enables Japan to circumvent her quota restrictions by sending her goods through China.

The Indian Tariff

Tariff has played such an important part in shaping the destiny of the cotton textile industry that the subject must be dealt with separately. The history of the Indian tariff dates from 1874 when an import duty of 5 per cent. was levied by the Government of India on cotton piecegoods and yarn for revenue purposes. Efforts were made by millowners of Lancashire to secure the repeal of the duties These efforts alarmed the few millowners of the day in India, and in their desire to defend the interests of the Indian industry, they organized themselves into an association, and thus came into existence in 1875 the Millowners' Association, Bombay, the premier employers' organization in the country. Persistent efforts by the Secretary of State led the Government of India, under Lord Northbrook, to appoint a Tariff Commission in 1874 As a result of the recommendations of this Commission, the import duties were not altered, but the tariff valuations were reduced in order to secure a reduction in the incidence of the duty. This was in 1874-75. At this time, a duty of 5 per cent. was also imposed on fine cotton imported from Egypt to please Manchester Lord Salisbury was the Secretary of State and his frequent pressure on the $Viceroy\ m$ India led to the duty on coarse count goods and yarn below 32s mule and 20s water being exempted from the scope of the duties in 1878. There was no doubt that this action was taken by the Government of India to placate Lancashire. Matters did not rest at this, and in 1878, the Government of India exempted all goods made from yarn not finer than 30s and all yarns up to 26s water and 42s mule from the scope of the duties, which mulcted this country in a revenue loss of £200,000 which the country could ill afford at that time.

The duties on cotton yarn and piecegoods were completely abolished in 1882 by Lord Ripon, and between 1882 and 1894 there were no tariff changes. In 1894, there was a deficit of £2,000,000 in the Government of India Budget on account of the increased military charges and adverse exchange. This led to the appointment of the famous Herschell Committee to explore fresh avenues of taxation. This Committee advocated the reimposition of import duties and accordingly, in 1894, import duties were reintroduced to the exclusion of cotton goods. It should be remembered that several items of millstores also came in for a duty. The situation changed in 1896 when a tax of 3½ per cent. was imposed on all imported and indigenous woven piecegoods. Yarn was free and continued to be free till 1922 when a 5 per cent. duty was first imposed for revenue purposes. The imposition of an excise duty on Indian mill-made cotton piecegoods evoked country-wide protests, and between 1896 and 1926 when the excise duty was finally abolished, it was condemned in no uncertain terms by persons representing all shades of public opinion. The duty on imported piecegoods which was fixed at $3\frac{1}{2}$ per cent continued to be so till 1917 when it was raised to $7\frac{1}{2}$ per cent, and later in 1921 to 11 per cent., and no changes were made in this rate

The trade depression following the boom of 1920-22 combined with the growing severity of Japanese competition assisted by unfair labour conditions, led in the years following 1923 to a renewed agitation for the repeal of the cotton excise duty. In August 1925, a deputation from the Bombay and Ahmedabad Millowners' Associations waited on Lord Reading, the then Viceroy. The situation worsened in the following

months, and in December 1925 the excise duty was suspended and it was finally abolished in March 1926

A special Tariff Board was soon after appointed to inquire into the position of the industry with particular reference to the causes of the depression, and to examine the extent to which it was due to foreign competition and also to advise on the necessity or desirability of protection. The Board found that the difficulties of the industry were mainly due to the unfair advantage which Japan enjoyed owing to the adoption of the double-shift system and the employment of women and children at night. The Board however, presented a majority and a minority report. Government were unable to accept the recommendations made, but as a measure of partial relief, they removed the duties on certain millstores and textile machinery.

The critical phase through which the industry was passing and dissatisfaction at Government's decisions on the Tariff Board's recommendations were voiced by a deputation consisting of millowners from all parts of the country, which waited on His Excellency the Viceroy on 12th July 1927 As a result of this deputation, Government revised their original decisions and imposed a minimum specific duty of $l\frac{1}{2}$ annas per lb on imported yarns with effect from September 1927 for a period of three years By the end of this period, although labour conditions in Japan had improved, a new danger had arisen in the shape of a large import trade from China where labour conditions were far inferior to those in India The measure was, therefore extended for a further period of three years ending on 31st March 1933

The utter inadequacy of the protection granted to the industry by the Yarn Protection Act of 1927 was abundantly evidenced by the increasing imports from Japan in the following years On 22nd July 1929, on the suggestion of the Association, Mr J H Hardy was appointed by Government to examine the possibility of substituting a system of specific duties for the then existing system of ad valorem assessment Mr Hardy's conclusions which revealed that Japanese competition was extremely severe in certain classes of goods manufactured in India were discussed at a conference of millowners convened by the Government of India towards the end of 1929, and in February 1930, Government introduced in the Legislative Assembly the Cotton Industry (Protection) Bill, which, as finally passed, provided for an increase in the duty on cotton piecegoods of British manufacture to 15 per cent and of foreign manufacture to 20 per cent with an alternative minimum specific duty in either case of $3\frac{1}{2}$ annas per lb on plain grey goods For reasons of revenue, these ad valorem rates were raised by 5 per cent in March 1931, and a surcharge of 25 per cent was imposed in October of the same year bringing the scale of duties to 25 per cent (British) and 31½ per cent (foreign) with a minimum specific duty of $4\frac{3}{8}$ annas per lb on plain greys At the same time, the duty on cotton yarn imposed under the Yarn Protection Act of 1927 was also raised to 6½ per cent or 1% annas per lb

Early in 1932, Government directed the Tariff Board to inquire into the question of the grant of substantive protection to the industry. In the meantime, the depreciation of the Japanese Exchange consequent on Japan's leaving off the gold standard in 1932, enabled her to place her piecegoods on the Indian market at abnormally low prices, and offset to a very great extent the protection conferred on the industry by the 1930 Act. Government, therefore, directed the Board to hold

a special inquiry into this question and in accordance with the recommendations of the Board the duties on foreign piecegoods were raised from August 1932 to 50 per cent or $5\frac{1}{4}$ annas per lb whichever was higher, but in view of the continued severity of the competition. Government once again found it necessary in June 1933 to raise the level of the duty on foreign piecegoods to 75 per cent ad valorem or $6\frac{3}{4}$ annas per lb. At the same time notice was also given of Government's intention to abrogate the Indo-Japanese Trade Convention of 1905

This was followed by the arrival in India of an official Trade Delegation from Japan and an unofficial Trade Delegation from the United Kingdom The United Kingdom unofficial delegates' deliberations with Indian millowners culminated in the much criticized Mody-Lees Pact of 1933, an understanding which was to be in force until the end of 1935 Similar discussions between certain unofficial delegates from Japan and Indian millowners proved abortive, but the efforts of the Japanese official delegates resulted in a fresh Convention and Protocol being agreed to early in 1934 under which a link was established between the exports of Indian raw cotton to Japan and the imports of cotton piecegoods from Japan Japan agreed to take one million bales of Indian raw cotton in return for a right to import 325 million yards of cotton piecegoods into this country with a maximum limit of 400 million yards for an offtake of la million bales of raw cotton Japan was also accorded most-favoured-nation treatment in respect of her miscellaneous trade. In virtue of the terms of the Protocol, the duties on Japanese cotton piecegoods were reduced with effect from 8th January 1934 to 50 per cent ad valorem with a minimum specific duty of $5\frac{1}{4}$ annas per lb on plain giey goods

The protective duties on cotion yarn and piece-goods imposed by the Cotton Textile Industry (Protection) Act of 1930 were due to expire on 31st March 1933 but as Government were not able to complete their consideration of the Report of the Tariff Board of 1932 (which had recommended the institution of specific duties based on weight subject to their being combined with alternative ad valorem duties to prevent a loss of 1 evenue and the imposition of a duty of one anna per 1 lb in the case of yarns below 50s count) before that date, they extended the provisions of the Act for another year

The Cotton Industry (Textile Protection) Bill of 1934 sought to give effect to the recommendations of the Tariff Boards on the cotton and sericultural industries in the light of the Indo-Japanese Protocol and the unofficial agreement entered into between Indian and Lancashire millowners So far as yain was concerned, the Act, as passed, fixed the rates of duties at 5 per cent (British) and $6\frac{1}{4}$ per cent (non-British) with a corresponding alternative minimum specific duty of $l\frac{1}{4}$ annas and $l\frac{7}{8}$ annas per lb on counts upto and including 50s In the case of piecegoods, the levels of the duties were fixed at 25 per cent and 50 per cent on British and non-British goods respectively with a mınımum specific duty of $4\frac{3}{8}$ annas and $5\frac{1}{4}$ annas per lb on plain grey goods The Act also guaranteed protection to the industry for a period of five years ending March 1939, but recognized the need for an examiration of the scale of duties on two occasions, firstly on the expiry of the Mody-Lees Pact at the end of 1935, and secondly, at the end of the Indo-Japanese Protocol in March 1937 Accordingly, at the end of 1935 Government directed the Tariff Board to examine the adequacy



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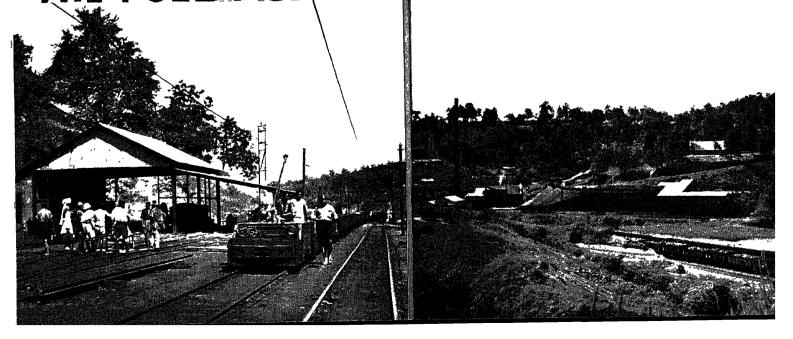
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Before starting the colliery Sir Maneckji Dadabhoy had to arrange for the extension of the railway line to Chirimiri from Anuppur, a distance of about 54 miles. The Railway authorities were sceptical about the ultimate success of the enterprise and of the earnings to be got from the traffic but events have more than justified the laying out of the new line and the railway is now earning a very substantial income from the coal traffic from the field.

The discovery and development of the Korea State coalfield and of Chirimiri colliery in particular are entirely due to the indefatigable energy and enterprise of Sir Maneckji Dadabhoy, who has spent immense time and labour in making this field a valuable coal-producing centre.

The success of Chirimiri Colliery has been great and every year has shown considerable improvement both in the output of coal and the sales thereof. The Colliery has not yet reached its full development and production capacity and, therefore, in future years it is bound to occupy an even more important place amongst the coal-producing centres of India than at present.

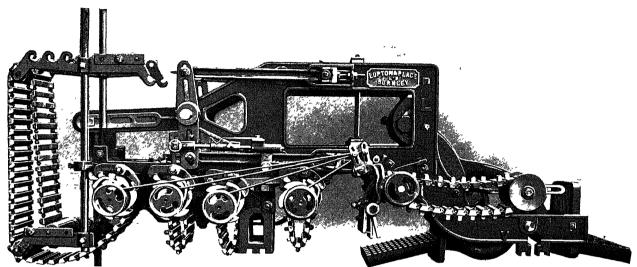
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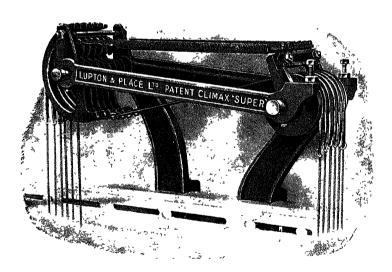
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of the then existing levels of duty on British goods. In accordance with the recommendations of the Board, Government reduced, with effect from 25th June 1936, the duty on all United Kingdom cotton piecegoods, with the exception of prints, to 20 per cent. ad valorem with a minimum specific duty of $3\frac{1}{2}$ annas per lb. on plain grey goods.

The Indo-Japanese Trade Protocol was subsequently renewed for a further period of three years ending March 1940 without any material modification in the rates of duties applicable to Japanese cotton piecegoods.

The negotiations between the Government of India and His Majesty's Government in the United Kingdom for the conclusion of a new Trade Agreement in replacement of that entered into at Ottawa in 1932 were brought to a conclusion early in 1939 and the new Agreement provided for a reduction of the basic rates of duties on United Kingdom cotton piecegoods as under:—

Printed goods .. 17½ per cent ad valorem.

Grey goods .. 15 per cent. ad valorem or

As. 2-7½ per lb.,

whichever is higher.

Others 15 per cent.

These basic rates were subject to a reduction of $2\frac{1}{2}$ per cent. ad valorem if imports from the United Kingdom in any year were less than 350 million yards and to an increase to the same extent in the event of the United Kingdom imports exceeding 500 million yards. The new rates of duty came into force on the 1st April 1939. In the year 1939-40 the European war affected imports from the United Kingdom and as her sendings of piecegoods did not exceed 350 million yards, the duties on all classes of British piecegoods were reduced by $2\frac{1}{2}$ per cent. with effect from 17th April 1940.

The present position of the Indian tariff on textile goods may be briefly summarized as below:—

A Yarn

(1) Of counts above 50s—

British .. . 5 per cent ad valorem.

(11) Of counts 50s and below—

Br tish 5 per cent. ad valorem or l₄ annas per lb., whichever is higher.

B. Cotton Piecegoods

Grey piecegoods (excluding bordered grey chaddars dhutis, saries and scarves).—

British $12\frac{1}{2}$ per cent. ad valorem or 2-3/16 annas per lb, whichever is higher.

Non-British .. 50 per cent. ad valorem or $5\frac{1}{4}$ annas per lb., whichever is higher.

Printed piecegoods and printed fabrics:—

British 15 per cent. ad valoiem.

Non-British .. 50 ,,

Others:—

British .. $12\frac{1}{2}$,, ,, Non-British .. 50 ,,

Wage Rates and Method of Payment: Basis of Remuneration

Reliable data on wage rates and cognate matters in the period preceding the war of 1914-18 are lacking, but so far as can be ascertained, the time and piece-work methods of remuneration which are current to-day were also current in those years, but the average earnings of the workers were decidedly less than they are to-day. Added to this is the reduction in the number of working hours per day and cash benefits accruing from the social legislation passed in the post-war period in the shape of Workmen's Compensation Act, Maternity Benefits Act, etc.

The following table extracted from "The Prices and Wages in India 1919" indicates the movement of wages in Bombay cotion mills.

		1892	1902	1912	1920	Reconstructed wage position end of 1920 approximately.
Carding Rovers Spinners Beamers Winders Weavers	• • • • • • • • • • • • • • • • • • • •	100 100 100 100 100 100	107 109 133 120 144 111	112 133 142 128 152 119	205 262 192 235 324 184	258 358 242 296 444 252

The above figures show the position as it stood in the first week of January each year. In 1920 two wage increases were given, which together aggregate to 26 per cent. In the case of time-workers and 37 per cent. In the case of piece-workers over the wages which existed in the first week of January 1920. If the wage indices for 1920 were reconstructed, taking into consideration these increases, the position would be as set out in the last column of the above statement.

No wage reductions were made till 1933 though the high cost of living in the immediate post-war year which necessitated these increases had been considerably reduced and though the Bombay mill industry was continuously losing money. At the end of 1933 individual mills resorted to unilateral action in the matter of wage reductions and this led to a strike in 1934. The strike collapsed in about seven weeks' time, but the chaotic position in the matter of wages was set right by the Millowners' Association who introduced a schedule of fair occupational wages. It was recommended that members who paid higher wages should continue to do so, but no member should pay below the level indicated. As compared to the wage levels which existed in the period 1921-32, the minimum wage schedule of the Millowners' Association represented a cut of 20 per cent. in the case of time-workers and 22 per cent. in the case of piece-workers. This cut was restored to the extent of about $12\frac{1}{2}$ per cent. to 15 per cent. in 1938 by increases granted by the industry as a result of the Bombay Textile Labour Inquiry Committee's Interim Report. The cut has since been more than set right by the 10 per cent. cash increases paid by the industry from the 1st December 1939 to offset a rise in the cost of living since the commencement of this war.

With the advent of efficiency measures in Bombay, the average earnings in the industry are very much higher than they have ever been. The following figures have been extracted from Wage Inquiry Reports issued by the Bombay Labour Office:—

Average Wages for all Workers: Bombay

		_	-	=
May	1914		Rs	16- 6-3 for 11-hour-day
May	1921		Rs	30-10-0 10 ,,
August	1923		Rs	30-10-1 10 ,,
May	1926		$\mathbb{R}s$	32-14-1 10 ,,
October	1934		Rs	28-15-8 9
November	1937		Rs	28- 7-0
1938			Rs	32-0-0 with 121 per cent interim
				increment
1940			Rs	35-4-0 with 121 per cent, interim
				increment and 2 annas per day
				dear food allowance

It is necessary to give these details here as allegations about reduction in wages are being loosely made without any reference to facts

Social and Labour Legislation

Apart from the Factories Act of 1922, subsequently amended in 1934, no legislative measure of a farreaching character was passed in the years preceding 1920.

On 1st July, the Workmen's Compensation Act of 1923 was brought into force This Act provides for the payment by certain employers to their workers of compensation for injury by accident, and this was really the first important labour legislation to be placed on the Indian Statute Book after the Factories Act

The Trade Unions Act of 1926 came next which recognized the workers' right to organize and combine for the protection of their interests.

Then came the Maternity Benefits Act of 1928, a provincial measure which has not yet been introduced in one or two Provinces of India. This Act provided for the payment of maternity benefits to women at the rate of As 8 per day for three weeks before and four weeks after confinement.

The next piece of legislation was the Trade Disputes Act of 1929 which provided machinery for inquiry into or settlement of industrial disputes in this country. This is an all-India measure Efforts to introduce similar measures were made in Bombay on a provincial basis in 1924, but these failed The serious labour trouble which existed in the Bombay textile industry in 1928 again brought this question to the forefront, and thus we come to the Trade Disputes Act of 1929.

The Royal Commission on Labour in India which submitted their report in 1930 led to a spate of labour legislation in the Central Assembly and in the Provincial Assemblies, and in the period 1931-37 the Central Legislature by itself was responsible for about thirty separate pieces of labour legislation. There was then a respite so far as the Central Legislature was concerned, since with the introduction of Provincial Autonomy, labour became mostly a provincial subject.

The Bombay Trade Disputes Conciliation Act, a purely provincial measure, was passed in 1934 immediately after the 1934 strike in Bombay. This Act provided for the appointment of a Government Labour Officer whose duty it was to go into workers' grievances and obtain redress from employers either directly or through the Conciliator appointed under the Act. In other words, the Labour Officer took the place of a trade union for securing redress of workers' grievances, and the absence of any organized and representative union in Bombay at the end of 1934 really justified his appointment

The Payment of Wages Act was passed in 1936 by the Indian Legislative Assembly. The Act prescribes that wages should be paid not later than ten days from the end of the month in respect of which they are due. It also prohibits deductions from wages except those specifically permitted under the Act and places a limit up to which an operative can be fined. It also lays down a procedure to be followed before taking any disciplinary action against an employee.

The next important piece of labour legislation was the Bombay Industrial Disputes Act of 1938 which came into force in July 1939, replacing the Bombay Trade Disputes Conciliation Act of 1934.

The entire field of social legislation is before the Bombay Textile Labour Inquiry Committee and their Report has been submitted to Government. The associate members have also submitted their written statements which have been forwarded to Government. When the Report and these statements are made public my views on various important questions will be found in the written statement submitted by me.

The Textile Industry and Committees and Commissions of Inquiry

In the last two decades, the industry has had to submit to more Committees and Commissions of Inquiry than any other industry.

ian any omen madeiny.	1	
Starting from 1924	••	There was the MacLeod Committee of Inquiry in connection with the 1924 strikes.
1926		The First Tariff Board.
1928-29	• •	The Fawcett Comm ttee of Inquiry (following the 1928 strike).
1929	3 3	The Pearson Committee of Inquiry (following the 1929 strike)
1929	••	Inquiry by Mr J H Hardy (in connection with scientific tariff and Japanese competition).
1929	••	Royal Commission on Labour.
1932		Matthai Tarıff Board
1935		Murray Tariff Board.
1937-40	••	Bombay Textile Labour Inquiry Committee.
		± *

I am mentioning only those Committees whose proceedings are still vivid in my mind, having taken part in each one of them, and not yet having finished with the one mentioned last.

Future Prospects

The cotton textile industry has had the misfortune not only of being subjected to various inquiriessometimes merely on account of loose allegations made by communist leaders—but also being subjected to various imposts by local authorities, or Provincial Government or the Central Government. Every time a fresh burden is proposed, it is claimed that the burden being small in itself is well within the capacity of the industry to bear. The sum total of such burdens, though each one may be a comparatively small one, imposes on the industry an extremely heavy burden. However, the prolongation of the war-although we all wish a speedy victory to the Allies-is in my opinion bound to bring in increased activity, giving the industry a chance to yet make reasonable profits ultimately although at the commencement of the war there was a definite setback. From a close study of the ups and downs of the industry, I find that the textile industry has invariably benefited when war conditions have prevailed as in the Franco-German War in 1871, or the Boer War of 1899 or the Russo-Japanese War of 1905, or the Great War 1914-18, or the Sino-Japanese War. Indeed, at the time of writing, this revival of trade has just begun and good business is reported in Indian piecegoods both for the home and foreign markets. Let us hope India will now be able to develop her export markets and that her industries in general and the textile industry in particular might be able to show steady progress.

Bombay European Textile Association—(Continued from p. 199) realized that the lower grade Indian cloth trade had been lost for all time, my friends there used to take consolation in the "fact" that anyhow Indian mills could not encroach on the finer trade, that is, over, say, 60s, due to climatic conditions. I assured them that a beginning had already been made on finer yarn and that with the aid of modern humidification anything was possible. However, they persisted in cherishing the legend concerning Lancashire climatic conditions and, above all, the inherited superiority of the Lancashire operative as a craftsman. Of course, it was a case of "wishing, thinking."

MILL "SAHIB" IN THE OLD DAYS By J. B. GREEN

ARRIVED in India towards the end of 1912, a stranger in a strange land, with only one friend—Mr. S. Harris—who met me at the tender, and very kindly introduced me, first, to his office staff of Felber Jucker & Co, and then on to the employers whom I was destined to serve for 18 years, i.e., Currimbhoy Ebrahim & Co I knew one other gentleman in the whole of India and I later found that he was Manager of the Globe Mill, Parel, Mr. Tom Bristol by name.

My only guide as to what to expect of the conditions of life and labour was a letter I had received from Mr Harris assuring me that anyone thoroughly equipped with the necessary technical and practical knowledge of spinning and weaving need have no fear, providing he came prepared to meet with all sorts of little difficulties such as one seldom comes across in Lancashire. In short, his letter said "Come with the heart of a lion prepared to conquer, or to die in the attempt." You may be quite sure that I was full of confidence as I felt I had some claim to a knowledge of the subjects mentioned above, as I had prepared myself by studying the subjects thoroughly and, incidently, satisfying the powers-that-be that I was worthy of their award of 1st Class Honours Weaving and 1st Class Honours Spinning, City and Guilds of London Institute, period 1908-9-10-11. My first sight of a cotton mill in India under everyday working conditions was that of the Fazulbhoy Mills, Parel, whose agents at that time were Currimbhoy Ebrahim & Co., who were agents also of several other mills in Bombay and one at Indore, Holkar State, C.I.

I was agreeably surprised at the way work was being carried on as I had imagined something quite different; of course, most of the cloths being manufactured at that time were longcloths of medium to coarse counts, checks, and a few fancy and plain susies.

An old stalwart from Oldham, Lancashire, Mr John Sankey, was in charge of the weaving section and another famous character, Mr. Tim Watts, was the spinner; it was intended that I should be billeted at Lower Parel. Mr. Sankey related his first experience of settling at Parel, and how he approached the members of a chummery at the railway quarters of the B. B. & C. I. Railway Co. on the subject, when the spokesman of the chummery told him, "it is not much of a place, but if you care to rough it with us and are prepared to pay your wack towards the bazaar and servants' expenses, you could join us at once"; needless to say John settled down there and then and his first night's rest was abruptly disturbed when his bedstead collapsed.

However, he soon became quite at home with them and he was asked, as a newcomer, to run the bazaar, a job he undertook so well that he was unanimously elected as permanent bazaarwalla. After this experience, I decided I would try the Fort, Bombay, and settled down in rooms at Watson's Annexe, Apollo Bunder. I travelled every working day down to Parel. Bombay in those days was a totally different place from what one finds to-day; a magnificent stretch of sand on the foreshore between the Swimming Baths and Churchgate Station was a morning rendezvous for all kinds of equestrian enthusiasts and the open space here acted as a splendid lung for this part of Bombay. Of course the B. B. & C. I Railway line from Churchgate to Colaba was then in full swing, and there was not a building of any kind from the Churchgate Station right up to the three gymkhanas at the Wodehouse Bridge end.

Very few taxis or privately owned motor cars were to be encountered in those days and a trip as far as Bandra was considered an event.

These were the days also when passenger liners could not come alongside at the Mole, as it was several years after that this magnificent structure came into use; one had to come ashore from the liners by tender and it was a much bigger job arriving at or leaving Bombay in those days

It did not take long to get accustomed to daily visits to the mills at Parel and I soon found that the mill agents were keen on embarking on a much more ambitious programme of cloth manufacture than was then the vogue. It was a case of "getting on with the job" The outlay of the capital was a small thing so long as some development and progress was forthcoming, and the necessary up-to-date machinery was brought out from England on an elaborate scale.

As the counts of warp and west became finer and there was a corresponding increase in the ends and picks of the cloth, changes in the spinning section had to be made to keep pace with the demands of weaving; at the same time the mill agents were very keen on keeping the costs of production as low as possible. This meant, of course, that more up-to-date methods had to be introduced throughout the whole of the spinning and manufacturing processes, and I am convinced that the lads from Lancashire and Yorkshire did their bit in trying out suggested improvements.

Of course, one must not lose sight of the social side of life which, then as now, played a very important part in getting the best out of life under conditions entirely different from what one had been accustomed to at Home. Here we found that unless one belonged to a club such as the Commercial Gymkhana or such other institution it was difficult to meet the right kind of people in order to let off steam that had been banking up during the day. Green's Restaurant was a favourite meeting place for the Sahib log and here many mills have been built and equipped and all sorts of records of production set up. There is the story of a comparative newcomer to India who could not resist the temptation of relating his experience in this direction when he heard the other chaps relating their experiences. When he had to tell the company the tale of what production he was getting, compared to that of his predecessor, it went something like this: "Eh mon tha should a seen yon place when I coom at fust, I've increased production moor na an awnce an a auf a spindle." "Bye gum aud mon that's a big jump, isn't it," said one of the listeners and then a bright idea struck another of the listeners, to ask what the production was before. "Why," he said, "it was three and a awf awnces" The increase was readily admitted as a possibility when it was learned that the counts spun were 16s.

Many stories could be told of the weaving section also, as in those days the "weight-per-loom" was the basis of production, and there was a big difference between a mill with an average reed space, say, of 48 inches and one with an average reed space of 34 inches; between the former, working chiefly on drills, and other heavily sized goods with medium to coarse counts, and the latter with medium counts, only sized for weaving, a difference of three to five pounds per loom per day was not considered excessive

I feel that I can claim to be in some measure responsible for a different basis of comparison in weaving production, as I always worked on efficiency based on loom speed, etc., I found that one had to play fair with the men at the mills, as it was a case of showing by practical results that some progress was being made.

Care in the preparatory departments of weaving and suitable sizing played a big part in the weavability of the yarn. The story is told of a *Sahib* weaving master who, when he received complaints of soft beams, etc., said: "Oh I'll soon put that reet," and took from his pocket a small bottle containing some kind of liquid and poured a few drops into the size in the sow box and remarked, "thal have no further trouble neaw."

Of course, knowledge of sizing, etc., has kept pace with other developments and I always find it easy to add useless quantities of good materials to size mixing if the facilities for size mixings are not nicely arranged. Many mills in the early days were only equipped for one size mixing, and that medium to heavy, and when they wanted a size mixing for bleacher cloths they simply diluted the standard size with water to get the desired thinness. This to my mind is a shameful waste of good materials, as where the cloth is treated in bleaching soon after it leaves the loom, all that is necessary as a mixing is as follows; sago or other starch, softener, and a small amount of chloride of zinc, say, 240 lbs. sago, 50 lbs. tallow and 5 lbs of zinc chloride.

The biggest drawback to good progress in India as to first class quality of cloth, is that the general run of labour does not take any pride in the cloth he produces, and often the jobber is more to blame than the weaver.

I at one time made a weaver buy a piece of cloth he had spoiled in weaving and he complained to the manager that the *Sahib* had forced him to buy the piece of cloth. The manager looking into the alleged grievance asked the weaver how many yards the piece consisted of, as the weaver had stated that out of the whole piece he could not get sufficient good cloth to make a shirt; when the weaver admitted there were thirty yards, you can imagine the collapse of the manager, and I was forgiven.

I consider that the social side of the mill Sahib's life has developed on the right lines as the flourishing condition of the Bombay European Textile Association with all its useful activities testifies.

In the early days of the B. E. T. A. we could generally muster one big function per annum, and this was

an outstanding event, so much so that one of our honoured members, now deceased, always said that it was the only "do" he ever cared to go to, because he could always get his favourite whisky throughout the night, while the other "do"s he went to ran out of his favourite drink before the function was over. I was responsible for the bar?

The splendid institutions such as the Cotton Laboratories at Matunga and the V J. Technical Institute, have played their part in the advancement of cotton spinning and manufacturing and has enabled the practical spinner to get the utmost out of the available cotton.

High drafts and high speeds of the various machines throughout the spinning section are largely responsible for a reduction in cost per lb. of yarn spun.

High speeds in winding and warping machinery are a mixed blessing, as it is necessary to supply yarn of a more regular quality than with winding and warping machines of the older type; another mistake is that in many mills high speed winding and warping have been somewhat discounted, because many of the warping creels have got single creel type, instead of magazine creels; the difference in production with the two types is, magazine creels 80/90 thousand yards per day of 10 hours, and only 50/60 thousands on the single creel.

The question of teaching the labourer to give a better quality of produce is rather heart-breaking, for so long as he can keep his machine running continuously he does not seem to attach much importance to such a thing as keeping his ends up, etc

SOME OLD-TIME PROBLEMS

Ву

H. L. T. ASPDEN

MANY of us had the privilege of working under the guidance of some of the old pioneers of textile practice in this country, and retain vivid memories of their genius and adaptiveness to circumstances and problems. To those of us, however, who remember the saying, "You are always learning in the textile trade" and keep our eyes open, it is obvious that the present generation more than successfully carries on the traditions for hard work, continuous research and genius for adaptiveness, and are certainly better men by reason of their scientific training.

The following remarks and incidents which are concerned with the adaptiveness of the men of the past will be read with interest:—

A passage between the mill building and the face of a rock needed widening. It was considered unwise to use blasting powder. The engineers successfully carried out the work by boring holes in the rock, filling the holes with water, and driving in tight wooden plugs with sledge hammers. The rock burst off in small portions either at the time of driving in the plugs or later by the wood plugs expanding as they absorbed the water.

Fastening down looms has always been somewhat of a problem. A conversation in a Bombay weaving shed about the year 1904 included a remark on the lines of "Can't you stop them looms from dancing about?" and elicited the reply, "All right, I'll gum the b—y things down." This the bright lad did by boiling

up a mixture of 5/8 parts far and 3/8 parts resin. In this he soaked pieces of 1-inch thick felt, raised the looms, inserted the felt under the feet of the looms while hot, dropped the loom on the felt pads, and allowed to set. This formula was brought from Brazil by Grimshaw Senior or Jack Aspden.

At a mill in Bengal, it was found that after the addition of another two lines of scutchers, the flue chimney was not big enough. As a temporary measure, holes were cut in the blow-room floor, ceiling, and up through the mixing room and roof. A wood frame covered with sacking was then run up to serve as an additional flue chimney.

In the old days men of the textile industry met at Tardeo, Parel, Chinchpokli and other places for the first "one" after sundown, and to discuss their various problems. A man could generally rely upon considerable thought being brought to bear on special problems of moment to him. I have recollections of a bungalow in Tardeo where, amongst others, present were Tom Brooks, Holden, Harry Shepherd, and Adurjee Shroff. It was at this meeting that I heard for the first time a differentiation between a centrifugal and a centripetal motion. One gentleman objected strongly to the "fancy" language used and claimed that the difference could be conveyed by saying "One pushes in and t'other pushes out."

I never actually saw this, but the tale used to be told of a man sent out to erect a mill somewhere up-country ın India. He arrived to find that the site chosen was some distance away from the village, part of the machinery cases was dumped on paddy fields, and only the foundations of the mill buildings were completed. He determined to live on the spot and get the job moving. He opened up a few card cylinder cases and had soon knocked together a temporary home made from the cases. He then went to see how the folks in the village did things about their food, and came back with an earthen pot and vegetables, and prepared himself a soup of some kind. Within a few days all machinery was lying open on the fields and the wood from packing cases had been used to construct a smithy, carpenter's shop, office and furniture. Not having brought or found spanners, he proceeded to make his own from bullock cart tyres after discovering that the carpenter had some sort of a file which would be helpful. This man is said to have started with raw field labour and had a small mill running in 18 months.

Water softening was a problem even in the old days. At one evening discussion a gentleman, whose name I cannot now recollect, gave us his opinion that better saponification could be obtained if fine oatmeal were put in a muslin bag and suspended in the water tank. Others promptly indicated their intention of trying this out. What results were obtained or to what extent stocks of oatmeal became depleted, I never learnt as I was moved to Calcutta. Doubtless the oatmeal was not wasted for the old boys were great on porridge.

Owing to coconut oil congealing in the cold weather, Tom Brooks, about 1903, decided to cut it out and use mineral oil on his carding engine bearings and in the comb boxes. For three weeks he was the most worried man in Bombay, seeking advice on how to keep cool bearings. His enlightenment came with the words "Don't you know your men rub their bodies with coconut oil before leaving the mill to stop them from catching cold?"

Tom wisely allowed a free ration of coconut oil, and gained the comfort of knowing that bearings had ceased to run hot on mineral oil.

Most men of the old days made their own roller varnish and cements. The formulas were held as grim secrets and the compounds were made in the seclusion of their bungalows. I worked as assistant carder to one man who would not divulge the composition of one of the best roller varnishes I had ever used. However, time passed, until one night I saw him bolt out of the mill bungalow cook-house with his red whiskers and shirt ablaze. We patched him up with a mixture of limewater, linseed oil, and a torn sheet. Next morning the secret was divulged to me with the words "Here, you make the d——d stuff from now on"

Static electricity was also sometimes a problem of the old days. A dry crossed belt driving drawing frames was often the cause of fibres standing up like a hair brush on the cover plates. The general counter to this was to keep the belts well rubbed with castor oil. One genius not being able to rely upon his men to keep the crossed belts lubricated, fastened a tin can containing oil to the side of the frame, knocked a small hole in the bottom, and led off a wick from it so as to automatically cause an occasional spot of oil to drop on the running-on side of the belt.

HOW COLOURED COATING BEGAN TO BE MADE IN INDIA

 $T^{\mbox{\scriptsize HE}}$ history of how the Sholapuri check was originated by a prominent Bombay millowner, now deceased, is highly interesting. The Sholapuri check was definitely the forerunner of all attempts to make anything in the nature of a coloured coating. The millowner referred to had been visiting Northern India during the cold season and had noted that those people who had warm clothing were always using the imported types of woollen or worsted cloths. On his return to the mills he explained to his weaving master that he would like something manufactured from Indian cotton which would give a resemblance and thickness approximating to the woollen or worsted fabrics. The weaving master then made a grandrelle warp yarn from blue and black doubled threads and inserting black weft, commenced an extremely successful period of time for the mills in the manufacture of Sholapuri coatings. Thousands of bales were manufactured by various mills who immediately saw the possibilities, and public taste and fashion have gradually resulted in its evolution into the present styles of coatings with innumerable fancy effects, using fancy doubled and spotted yarnsprinted yarns, together with improved finishes, and resulting in cloths comparable with those produced in any part of the world.

The Fifty Years—(Continued from p. 14)

Perhaps those words of Sanitary Commissioner King were the inspiration from which have sprung up some of our industrial ventures They strike a note of reality in the midst of a pioneering but impractical generation-a generation too content with trifles to look farther into the future

October 1898. Sorabii Rutnagur loses his father, a bereavement that he deeply felt.

Jamshedji Tata makes a munificent offer to provide a lakh and a quarter per year for the furtherance of educational objects, principally in post-graduate studies and scientific research. This great philanthropic gentleman had early foreseen the need in India for education. The sphere in which he was most interested was industrial development. Mr. Tata with his shrewd foresight had early realized that if India was to keep pace with industrial developments all over the world, it must lav some foundation for that development-a foundation that was sound and solid and on which the young would grow up to face the problems that were later to confront them To-day, looking back through the years, one realizes how well-spent that money of Mr. Jamshedji Tata was. This scheme was known as the Tata University Scheme and has culminated in the Research Institute at Bangalore.

The plague disappears as mysteriously as it originated, claiming 13,000 men as its victims.

* The Times of India celebrates its Diamond Jubilee.

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A touch of modern journalism is seen in the editorial headline: "More Smoke Wanted." It deals with the speech of the Provost of Montrose, made in the industrial part of his native Scotland. It appears that the Health Committee of Montrose had reported to the Police Commissioner certain complaints

"that had been made regarding the smoke of several of the large chimneys of the town, and the Committee recommended that the Surveyor should be mended that the Surveyor should be instructed to interview the proprietors of the offending clumneys to see what could be done to abate the nuisance Provost (Mayor) Mitchell then took up the cause of the chimneys and protested against any undue interference with smoke from public works. (Hoon my word.) from public works. 'Upon my word,' said he, 'I think in Montrose we have reason to complain that there are so few chimneys, and if we are to begin to pester and annoy manufacturers in the legitimate course of their business, how can we expect trade to improve? I suppose there are few people in Montrose who object to see smoke issuing from large chimneys I must object to the recommendation of the Commuttee."

The Journal then says:

"The speech of the worthy provost (we call him worthy because the term is (we can him worthy because the term is historical) is a beautiful specimen of Municipal oratory. He confers a new dignity on the chimneys by calling them public works, and boldly includes black smoke in the legitimate course of the business of local manufacturers."

A beautiful specimen of municipal oratory! Was that intended as a compliment ? I wonder.

1900 brings in a new year, a new century, a new era. It is the era to which you and I belong. Looking back was a gloomy affair. The general features of the textile trade had been an abnormal amount of litigation, share depreciation, vanishing profits and lowered output. "Optimism is a little out of place just

at present", the Editor said in his three columns on "The Past Year," "it could serve no good purpose and would deceive nobody.'

"It is impossible to regard the past "It is impossible to regard the past year as having been a prosperous one for India, and it would be idle to deny that the future is full of uncertainty. It is quite possible that, though by the end of the Budget year the revenue and trade returns will be high, the distress caused by plague and famme is a factor which must considerably tend to modify any optimistic conclusions in dealing with the optimistic conclusions in dealing with the

"On the other hand we may, while fully recognizing the adverse course of events be amply justified in looking at the brighter side of things. Once Bombay is free from plague the tide of her prosperity will be in a fair way of returning. The crisis in our textile industry will be productive of good in the long run by eliminating those badly-managed con-cerns which have been weak spots for years in our industrial activity, and with

years in our industrial activity, and with a good and seasonable monsoon we may venture to hope that the last half of 1900 will make some amends for the gloom and depression of its opening.

"Although Hindu astrologers predict that 1900, 1901, and 1902 are to be years of prosperity, the curtain falls on the old year in gloom and depression. Bearing in mind the existing condition of the mill industry, it opens up some the mill industry, it opens up some curious reflections to find that in February last the question of 'overtime work in Bombay cotton mills' was actually discussed in the Press; though such was indeed the case. This, of course, was not representative of the true state of affairs and is only instanced here to show how strangely, at times, the very opposite poles of opinion invite the attention of the public."

Gloom and Depression—these words have come home to us more than once in the forty years that have gone by, forty years in which one great war was fought and in which another is already getting into its full stride. The early years of this twentieth century have been years of struggle and stress, tinged everywhere with a restlessness that has become characteristic of it, as if it was of it, part of the era, part of those generations which belong to it We have become conscious of this restlessness-conscious that everything changes and nothing can long endure. Even so, looking ahead, the Editor of the Indian Textile Journal could hardly have foreseen the gloom and depression of these years that were yet to come.

Obituaries become more and more frequent and the textile industry loses a great person in the late Mr. N. N. Wadia Already this fine Parsi gentleman had achieved some success in that at an open meeting of Labour, he, a capitalist, was picked to represent them. A portrait of him appears with his obituary notice, a ventable Edward VII in pagree and dugla, suitably bearded with that same Edwardian expression and his hand tucked into the flap of his coat like Napoleon. Mr. Wadia died in England at the seaside resort of Bournemouth. The man was apparently much liked by his compeers for the tribute paid to him reads as sincere as it is flattering -a tribute which any man, dead or living, could be proud to receive. The Journal says:

"He was no maker of long speeches, no fervid writer to the Press, no political enthusiast whose best energies were dissipated in the efflorescence of a luxuriant oratory. Not that these things are to be despised, but that was not Mr Wadia's way. He was essentially a man of action, a pioneer in the arts of peace And as such he will be remembered: by the colleagues with whom his lifework was associated; by the community to which by race and birth and religion he belonged, and by the city, which was proud to own him

A Japanese Art Exhibition is held in Bombay.

All of a sudden a curtain falls. The bells of Westminster toll the knell of a parting era Queen Victoria is dead—that grand old woman, whose personality gave an epoch its name A hush fell all over the world and though a century had closed only a year ago, this was an even more decisive line of demarcation in the history of generations and the progress of mankind. In a beautiful passage on the first editorial page, shrouded with the deep black of mourning we read :

"We are still too near the period of We are still too near the period of Victoria to fully appreciate the place it will occupy in history, but of this much we may be assured, that it has been one of high aspirations, of strenuous endeavour, of wise counsels and great intellectual activity in every branch of human knowledge, and when at last, full the rest of trumphs of corrections the of years, of triumphs, of sorrows, the mevitable end approached, it had still all the dignity of the life of our Queen-

Looking back at these years, and comparing them with the years that have followed, we are convinced more than ever that the great Victorian era bore this hall-mark of dignity in every phase of its activity-dignity such as we often long to see in the irresponsible Bohemianism of our times.

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One by one the great gallant worthies pass away. N. N Wadia, and now Sir Dinshaw Petit, the first Baronet—a local boy, who began life as a clerk to amass a fortune and a position of respect among his people. For here was a man that rose from the bottom, a poor lad who fought his own battle in life and according to the standards of that day was emmently successful What a loveable person he is as he sits modestly before the camera, still conscious of the poverty of his early days, still as humble as ever. He has that something in him, which the French would speak of as "sympathic."

Among the living, however, Jamshedji N. Tata still stands out as a great man of industry —the quant whose monument was built by his own self—a monument which stands wherever the name Tata appears. A four-page appreciation of this great man with a vision of the future is summed up in the last words:

"Faith in himself, faith in the future of his country, and faith in education as the best and only means of ensuring that future, constitute, so far as we can judge, the crowning conviction of Mr Tata's the crowning conviction of Mr Tata's career, for which all friends of India will earnestly invoke the gifts of length of days abounding happiness and prosperity.'

The Bombay Millowners' Association have an annual general meeting. The date is 24th May 1902. Mr John R. Greaves is in the chair and one of the speakers, Mr. Vithaldas D. Thackersey says, .

"I firmly believe that the time has now come when by continued agitation the eyes of the Government should be opened."

Is one to suppose that at any period of its history the Millowners' Association were contemplating anarchy!

Mr. Thomas Edison makes another invention.

A new series, very instructive and very popular, is specially written for the Journal-"From Cotton Field to Cloth Market"

Mr. Burjoriee Padshah's name begins to figure here and there. His memorandum on "The Cotton History of India and the Cotton Duties" is the subject-matter of a first leader.

A slight experimenting with letter-heads is noticeable. A flourish predominates, but on the whole the Journal retains its simplicity of style.

Style in journalism is most important. It is of the essence of the writing. Editorial, interview, obituary-these are as much of the writer as of him on whom it is written. As such one has to pause to read the first interview that appears in the Textile Journal. It is pompous, awkward and very self-conscious. Like the man interviewed it is most uncomfortable reading. But it is an interview and so marks a new approach. Headed "India's Progress and Trade" it is an interview with Sir Howard Vincent It begins:

"Sir Howard Vincent was scanning the sunlit waters of the harbour from the verandah of the Yacht Club, when I called upon him. He was greatly interested in the ships of the Indian fleet, and as he listened to the roar of the guns at the saluting battery, and gazed at the majestic lines of the admiral's flagship, I almost imagined that he was making 'copy' for the benefit of his constituents in central sheffield. I took a got bonde him and Sheffield. I took a seat beside him and plunged at once into the object of my visit. You were in India 20 years ago, I believe, Sir Howard How do your impres-

believe, Sir Howard How do your impressions compare with those you formed on the occasion of your former visit?

'There is no doubt,' he replied readily, 'as to the immense progress which India has made in the last 20 years; and of the enormous development of her internal resources, the great increase of education, and the advance in popularity of the railways as a means of locomotion among the native races. Best of all,' he continued, 'there is no doubt as to the increase in loyalty to the British flag and British rule.'"

No doubt Sir Howard, no doubt at all !!

Mr. B J. Padshah contributes a first class article on the "Fiscal Issue: India's True Interest.'

Then comes one crashing headline It was June 1904. It makes us pause as nothing in these pages has done It reads: "The late Mr. J. N. Tata." The issue has a frontispiece of a very grand old man with a flowing grey beard, chiselled features, a distinguished forehead and eyes that are looking far away into the future. Jamsetjee Tata was like that-a visionary who was more than a dreamer. He rose from the ranks-a poor boy who left this country the greatest legacy-that of an industrial future. He was a sort of figurehead of industry-not just one among a number of rich merchants. He shaped what resources he had towards building up the industrial resources of this country, towards a nationalised conception of industry, towards all that Tatas stand for to-day. Once when the Tata Steel Company was hard pressed and Government's support had been disappointing and the banks were not too eager to loan on the Company's name, it fell to the lot of R. D. and Sir Dorab Tata to take the burden of the Company on themselves for as R. D. is supposed to have said to Dorab, the name of Jamshedii Tata must never be let down. That is the sort of inspiration the name of Tata has been to

those who have followed in his wake. There are few men in India who will be so long remembered for their unselfish devotion to their country and for their efforts to elevate it to a position of first class industrial importance

The October issue of 1904 marked the fifteenth year of the Journal's life. In an editorial it says :

"It has been one of the chief objects of the Indian Textile Journal to aid industrial progress in India by publishing useful information regarding methods and processes of work that might be useful to our readers, and we have been frequently rewarded by acknowledg-ments of the practical assistance conveyed in our pages

Lord Minto comes to India as Viceroy.

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An innovation is started, for, under the articles "Designs for Cotton Fabrics," along with a working pattern, a sample piece is also attached.

The Factory Commission under W. T. Morrison makes its notes. Examined on November 27th was Mr. Jamshedji A. Wadıa described in the Journal as "an influential mill

agent." Here is an extract of his evidence.
"The President: Have you noticed any improvement in the skill of the labourers?
—don't think so, not much Machinery has improved very much of late, but not

All the other millowners had said that there was an improvement in the skill of labourers. Don't you subscribe to that opinion?—am not aware of such an improvement Perhaps long hours might have contributed to that

Witness, continuing, said: We are just now doing what suits us and suits our men. There is no agreement among millowners as to the hours of working. Our weaving trade is very good now, still, we would not work for more than 13 hours, although it would be profitable to do so. The spinning business is bad, still, we don't want to curtail the hours of work. We do not like to disturb our men or ourselves, since we have settled down to 13 working hours a day.

Do these men save money? —

so. They do make savings which they remit home and invest in land. Every workman is anxious to possess even a small piece of land."

The Journal runs a prize competition-two prizes, one of ten and one of five being offered for the best and next best set of answers. For the first time a "Situations Vacant" and a "Wanted" column are visible

Mr. Sahlın delivers a lecture at the Wılson College on "The Tata Iron and Steel Works." Here are a few extracts from the lecture.

*

Mr. Sahlin says.

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"Your great fellow-citizen, the late Mr. Jamshedjee Tata, conceived, many years ago, the idea that a national steel industry ought to be established, for the benefit of the great people amongst whom he lived and worked so successfully, and for whom he has done so much. With a generous hand he spent considerable sums necessary to explore exhaustively the jungles of the Central Provinces. In many places iron ore was found; in some places of excellent quality, and in large quantities, but the cost of transportation and of a suitable fuel were found to place and of a suitable fuel were found to place msurmountable difficulties against projects to utilize them. Finally, a large deposit of high-grade hematite iron ore, containing from 60 to 65 per cent. of pure iron, out of a possible 70 per cent. was found in the State of Mourbhanj in the hills of Gurumaishim His sons and friends, however, have devotedly and

with indomitable courage and perseverance, continued and developed his plans Nearly four square miles (2,400 plans ideally four square fittles (2,400 acres) of coal land have been secured in the best part of Jheria field. This land is underlaid by four known seams of workable coal, combining a thickness of 40 feet of solid fuel, corresponding to a total recoverable quantity of mineral of about 40,000 tons per acre or nearly 100,000,000 tons, in the area owned. To begin with, however, it is intended to exploit only the upper seam, yielding about 8,000 tons per acre, or 20,000,000 tons for the entire area controlled."

This was the dream of Jamshedji Tata which eventually became known as Jamshedpur.

The Empire Theatre is built The Journal refers to it in a page and a half as a "Bombay Enterprise."

Sir Jamshedjee Jeejeebhoy, the fourth Baronet, passes away, June 1908.

July 1908 has an appreciation of Sir Jehangir Cowasji Jehangır "who has just been created a Baronet." The Journal says :-

"Sir Cowasıı Jehangır, his uncle, who subsequently adopted Sir Jehangır, was a self-made man. A born philanthropist, a financier by instinct, having tact and dignity, of curbless energy, and ideal host, he had won for himself a position among Indians which no one less gifted by nature could have ever hoped to by nature could have ever hoped to attain. To his princely donations and public spirit Bombay owes its Ophthalmic Hospital, the Strangers' Home, the Elphinstone College building and the University Senate House; Poona its Civil Engineering College; Surat its Civil Hospital, and Hyderabad (Sind) its Lunatic Asylum."

In the centre of the page is the picture of a very pompous gentleman, middle-aged, with whiskers that are at least six inches long. a cravat with diamond pin, a silk-faced heavy winter suit, stiff collar and cuffs, gold chain striding across a high double-breasted waistcoat. He looks to me most uncomfortable in all these warm clothes, but one cannot expect a baronet of those days to be too comfortably dressed.

Mill riots in Bombay-Mr. H. O. Quinn, Secretary to Government, writes a letter to the people of Bombay. It reads:-

" Now that tranquillity has been restored to Bombay, His Excellency the Governor in Council earnestly hopes that its citizens of every degree will seriously consider the lessons of the recent disturbances

The business of a great city has been suddenly interrupted with the result of losses which must bear heavily upon the poor. Harmless Europeans pursuing their ordinary avocations have been attacked with stones. Millhands desirous of continuing their work have been intimidated by acts of violence discreditable to a civilized

city.
Worst of all, 15 lives have been lost and
The Government 38 persons wounded. The Government deeply deplores these casualties, which would have reached far larger dimensions but for the self-control and discipline shown by the troops under great provoca-

tion from persistent stone-throwing.

In no case was a shot fired except after the mobs had been urged to disperse quietly and when they had resorted to acts of violence endangering life and

These disturbances and this sad loss of life are wholly due to the organized efforts of persons who do not in all cases belong to Bombay, and who were careful to remain in security when the lives of the poor people whom they had deceived were in danger. Even these persons cannot rejoice at the results of their work. Who then can be said to have benefited in any way? in any way?

Solely in order to check the violent section of the Press which threatens to bring disasters upon the people of India the Government were forced—in the interests of the people—to take certain measures No man of intelligence can believe that the policy of Government would be affected by these futile but fatal demonstrations.

It is the earnest desire of the Government that the great city of Bombay shall not again be menaced by proceedings which can only injure its prosperity and bring grave discredit upon its reputa-

The feel of Volume XIX is so different from the rest. The date is October 1908 and we see for the first time art paper used for the Indian Textile Journal

The Maharaja of Benares writes a letter to the Times (presumably the London Times) expressing his views on Swaraj – about which there is, he says a good deal of talk. The following are extracts from this letter dated 25th September 1908:

"There is a good deal of talk going on There is a good deal of talk going on these days about *swaray*, or the making of India a self-governing country. There are 689 self-governing States in India just at present, the status and independence of each of which is clearly defined and guaranteed by the British Government and embodied is british Government and embodied is british growing. ment and embodied into treaties and ment and embodied into treaties and engagements. The question now naturally arises, What is this new self-government meant to be? Is it meant to be the 690th State co-ordinate with those already existing, making each State free to make peace or wage war with each other, and thus bringing India once again on the verge of the internecine warfare from which it was luckly saved by the timely advent of the British Power? Or does it mean the combination of these States into a federation (like the United States of America) and subordinated to a central Government presided over periodically by Boses, Iyengars, Ghaswallas, and Ranades? Or is it seriously contemplated to merge these Native States along with the British districts into one self-governing State, making them lose their identity and individuality to preserve held. state, making them lose their identity and individuality to preserve which our forefathers sacrificed their dearest and best, and for the preservation of which the faith of the British nation is pledged?

The British public should know that the native chiefs of India will not brook such nonsense talk, and it is high time that it is put a stop to and officeally declared acres.

put a stop to and officially declared against. India of the present day was not found out by chance. The edifice of Empire is the combined work of the best British and Indian talents, and has been raised after centuries of hard labour, with a high ideal in mind, from out of a confused mass. The British ought to be proud of it, and The British ought to be proud of it, and should try to preserve it. Are these solid works to give way because the age of action is now replaced by that of talk and the stalwart and far-seeing statesmen by quacks and mountebanks?

While on this subject, I might be permitted to mention by the way, that I could not understand how swadeshism-cum-

boycott is regarded to be the panacea of the so-called chronic poverty of India. To my mind, commerce and trade are sure signs of wealth, and if they mean the exchange of commodities between one country and another, it passes my imagination how trade and commerce can flourish under the ban of boycott of foreign goods. It is very easy to stop all imports by boycotting products of other countries, but what is proposed to be done with our enormous exports? Do our irresponsible politicians propose to let the raw produce of this country rot in India, if other countries shut their doors against it by way of retaliation? Boycott begets boycott It would also be interesting to know how the millions of rupees which our import duty adds to the revenue of India are proposed to be found if all imports are stopped? Will our amateur politicians make the loss good?"

This letter is perhaps the most interesting document that we have been able to unearth from the past.

Foreign Notes .- In the House of Commons, Mr. Montagu, the Under-Secretary for India, replying to questions ie the enhanced silver duty in India and also the excise duty, said that Lord Morley would continue to watch the effect of the silver duty on Indian trade. He did not propose to interfere with the excise on the Indian cotton mills. Replying to Sir E. Sassoon, on the same subject, Mr. Montagu said the Government of India did not anticipate any serious diminution in the importation of silver on private account and that hitherto the effect of the duty on the price of silver had been extremely small.

Edward VII passes away, and George V comes to the throne. This event somehow has not that same significance as the passing away of Queen Victoria.

The year 1911 began well with the inauguration ceremony of the Tata Hydro-Electric project. This great scheme had aroused much interest in the possibilities of water power along the Western Ghats and though a Hydro-Electric scheme was beyond the purview of the textile industry, this Journalhad played a part in bringing about the Hydro-Electric scheme which will not easily be forgotten. Already, as far back as 1899, Mr. J Wallace, C.E., one of the earliest contributors to the Indian Textile Journal, wrote in an editorial:

"The progress made in the economy of transport of electric current brings us each year nearer the time when the power of falling water in the Ghats on the other side of Bombay harbour will be utilized in our city for industrial purposes "

His forecast of the shape of things to come was contained in the passage:

"Electricity has hitherto led a rather recarious existence in Bombay for precarious existence in Bombay for reasons which our limits of space forbid us to enter into, but we venture to think that with the enormous resources of force that are wasted within sight of our city the electrical engineer may look forward to a period of intense activity and of prosperity.

To-day as we pass the Ghats near Campoli, we get some idea of the expansion of this project and how it has worked itself up into one of our premier utility concerns.

"Spindle" contributes a series on "The Cotton Trade of Bombay."

J. F. Bradbury becomes the new President of the Bombay Millowners' Association-January 1913.

Mr. John Wallace writes on "Humidity in the Cotton Mill," a subject on which he has specialized.

Advertising jumps up considerably, and pages of advertising matter interleave the

I look carefully through the months of the year 1914. Nothing in all these pages right down to September 1914 gives any indication of a war. The editorials are, one regrets to say, disappointingly prosaic and technical. July 1914, for instance, has editorials on "Coal Consumption in India," "The Education of our Working Man," "Conversion of Liquid Oils into Solid Fats," "The Industries of the

Philippines," "The New Combustion"-but not a word about war. August of that same year deals with "An Appeal to Employees," "Iron in Ancient Egypt," "Well Sinking in U.S A "-but no war. Only in the September issue we see a small note and we notice a change of paper The note reads:

"The change of paper from the current issue of the Indian Textile Journal has been necessitated by the non-arrival of shipments of the art paper on which the Journal has hitherto been printed "

but why no one would ever know. The editorial columns are still content to deal with "Humidity and Ventilation in Flax Mills of Great Britain'' and "Trade Marks in India." Only in a contributed article on "Japan's Textile Trade: the Effect of War'' written by the Kobe correspondent, do we first strike upon this word War; dated August 23rd from Kobe and in the shape of a letter it says :-

"When I wrote last month there was hardly a cloud in the sky. Nobody cared very much to what degree of humilation Servia would or would not submit and everything went on with active but easy assurance 'as in the days of Noah.' Suddenly there was a blaze Austria declared war on Servia, Russia on Austria, Germany on Russia, France on Germany
—each declaration being more serious
than the last And here on the opposite side of the world, trade stopped as if a universal bankruptcy had suddenly over-taken everyone The banks stopped taken everyone buying bills, they put up their overdraft rate to 12 per cent and demanded that the goods they had a lien on at sea should be insured against war. Insurance com-panies quoted 60 per cent. as a war risk rate to Europe before ever England declared war. Then came the call to arms. The local papers contained proclamations in four languages calling men to the colours. The Germans were first to leave, and after them the French—both run off by a cosmopolitan community international in its friendships and loyally refusing to let politics interfere with personal regard. This accentuated the paralysis. The biggest German firm lost two-thirds of its European staff at one swoop and discharged 150 Japanese packers next day. The rickshaw men and boatmen at the bunder were out of work by the hundred, dock coolies by the thousand—and all this before there was news of anything more serious happening than the Austrians failing to cross the Danube."

But though Kobe had time to write to Bombay the Indian Textile Journal had not written a line.

Mr Findlay Shirras, Director of Statistics, gives his Annual Review of the trade of India 1913-14.

3-14.

"The chief characteristics of the year 1913-14 were (1) a failure of the rainfall in some parts of India; (2) Bank failures which were confined chiefly to the Punjab and Bombay, (3) a glut in the piecegoods trade; (4) some difficulty in railway transport With the possible exception of Australia, India possesses the most precarious rainfall in the world and the year under review was no exception to this under review was no exception to this

"A glut in the piecegoods trade took place, especially from October 1913 to January 1914 Stocks of both imported goods and local-made cloth in Bombay were much heavier than they had ever previously been, and owing to the recent financial troubles and the breakdown of

credit, goods were going into consumption very slowly during the later half of the year. Shipments were far in excess of requirements, and the docks were so full that there was great difficulty in storing piecegoods. The markets were getting meaker daily, and prices were steadily declining owing to this overstocking. The white piecegoods market in Calcutta also was seriously affected by

the lowering all round of prices for goods

in Manchester and the famine conditions up-country It was proposed in January by the Marwari Chamber of Commerce, Calcutta, to cease buying textiles in Great Britain for four months owing to the glut in Indian markets. No effect was given to such proposals "

In October 1914 we find a double-column spread headed "India's Opportunity." It shows the vast possibilities offered to India in the shape of industrial development by the stoppage of imports due to the war.

A fascinating article follows in November headed "Real Swadeshi."

"India has recently been passing through progressive experiences which, it is hoped, may leave a permanent and beneficial trace on her economic history Only a few years ago a crowd of Bengali reformers proclaimed a swadeshi movement whose disciples engaged to boycott native products, even if less convenient than the foreign article. The natural result of an increased demand was fully appreciated by the Bombay cotton manufacturers who put up their prices This patriotism, however, turned out to be a more costly luxury than was expected, and its flame went out ignominiously, but it left a useful lesson which was taken to heart by many loss enthusiactic but to heart by many less enthusiastic but more level-headed people, whose indus-trial work formed the foundation of the Bombay Swadeshi Co-operative Stores Company, Limited "

February 8th saw the opening of the Tata Hydro-Electric Works

Volume XXVIII, which begins with October 1917, has a red cover-an innovation which later caused a considerable amount of comment from die-hard, blue-blooded sources. There is also a change in advertising, advertisements being grouped and exhibited together in the beginning and at the end

What happened between January 1918-January 1919? The publishers' announcement, however, explains the missing issues from February 1918 to December 1918:

"The difficulty of exporting machinery from England to India in the later stages of the war and the abnormally high cost and scarcity of suitable paper necessitated the suspension of the issues of the Indian Textile Journal from February 1918 to December 1918 We have, however, to tender our sincere thanks to advertisers and subscribers who were good enough to offer to continue their support during this period."

In a first-rate editorial headed '' 1919'' we

read:
"The world has never known such a which we have "The world has never known such a New Year as that upon which we have just entered. It marks the termination of the most destructive war ever known, whose influence was felt in every land, however remote, visited by vessels of war or of commerce.

war or of commerce.

India is now relieved of all anxiety regarding the security of her borders from Russian aggression and German mingue. The aeroplane has proved an ideal sedative for the border theres who have no remedy against a foe that can cross their hills at the rate of an express railway train and bomb their villages while they are away on a raid The prospects of industrial and social

progress in India were never brighter than at the present time; we shall presently have three large iron works in operation, and the whole of their product in steel and iron will be absorbed by the country. Our forests are being actively developed, and better roads are being made to convey the product to markets that have been depleted both of iron and timber. The drain of coal for export has raised the cost to famine figures which

peace conditions will now abate. The cost of materials, the enhanced cost of land and of rents, all combine to indicate that any extension of the cotton-mill industry should be made on the mainland where land is cheap and electrical current may be had Bombay will have to follow the example of Manchester whose tall chimneys began to diminish fully fifty years ago."

The Kamgar Hitwardhak Sabha, an association for Indian working men, is established in Bombay.

We now come to one of the lean phases in the history of the Journal. It was disappointing enough that the Journal had no record of the outbreak of the war. There was no Journal when the war was over and only in January 1919 do we get a somewhat feeble effort to revive it. But these months were hard months. Advertising is scarce and even the reading matter is of an order which falls short of the earlier numbers. The paper hardly reflects the mood of the times. Perhaps it was the living too much in those surroundings that accounts for the complete absence of any reference to them. 1919, one gets the impression, was a very quiet and peaceful year. Was there trouble in Amritsar? Was there a nationalist movement? Was there a body called the Congress? Was there a Khilafat movement? Were there strikes? The Indian Textile Journal right upto the end of 1920 is painfully oblivious to all such events.

The strikes in Bombay start. "A strike," says the editorial of the Indian Textile Journal, is the editorial of the Indian Textile Journal, "is the most costly manner of settling disputes, and it always leaves a sense of bitterness on both sides. The striker demands pay for the days he is not working—a deliberate provocation to the employer to whom he dictates terms including the preposterous condition that men who are disabedient or incompetent

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men, who are disobedient or incompetent or superfluous, must also be found a place side by side with the deserving.

Sir Joseph Kay becomes Chairman of the Millowners' Association.

Then comes an article which must be reproduced in full and without comment. It is an editorial headed "Mr Gandhi's Swaraj."

"Even the best well-wishers of selfgovernment begin to wonder if Mr. Gandhi is ma position to realize the growing absurdities of his political propaganda which is now being applied to cotton and wool. He wants millowners and the people to give up all years and cleth the people to give up all yarn and cloth that is English, and proposes to stop the trade of India in British piecegoods which has brought prosperity to thousands of

has brought prosperity to thousands of his countrymen.

If a portion of the crore of rupees, which Mr. Gandhi and his friends have been able to collect, are to be utilized towards the consummation of impossible and frutless pursuits, such as the boycott of British cloth and yarns, the contributors will have additional cause for complaint against the manner in which the funds are being misapplied and wasted. Has Mr. Gandhi inquired into the cost of spinning a pound of yarn of average 20s count on an Indian chanka as compared with that of a pound of mill yarn, and how it would recompense the spinner in each case?

Mr. Gandhi does not discriminate

Mr. Gandhi does not discriminate between cotton and woollen yarn. The latter is produced in the hill districts where the people wear only woollen clothing and where the climate frequently interferes with outdoor work. But a pound of woollen yarn is much more quickly spun by hand than a pound of cotton, and is much more valuable. So, the hand-spinning in the Himalayas will continue so long as the outdoor work of the people is liable to interruption by cold and snow.

It may be regarded as a sign of the times that the woollen cloth woven by these people on handlooms is generally made up into garments by British sewing machines that are to be met with in every village of any size. Does Mr. Gandhi propose to shut out these machines as

Hand spinning of cotton is practically dead in India. The weaving of fine muslin, for which Dacca was once famous, has been revived and restored to a flourishing condition at Chanderi in Gwalior State but every ounce of the yarn employed is spun in the mills of Salford. Fortunately for the muslin weaver, this yarn is too tender to be used on a steam-driven loom, and so the work remains a cottage industry, maintaining all the best features of hand work and ensuring good pay to the weaver."

To-day in the light of the events of 20 years the Indian Textile Journal may be inclined to reconsider that verdict. Note also the words "Mr. Gandhi."

 ${
m Mr.}$ John Wallace, joint Editor of the ${\it Journal}$, expires on 9th October 1921 at the age of 79. In an ample obituary published by the Journal appears a picture of this dear old man, seated at his desk in the office of the Indian Textile Journal. A white sola topee hangs on a peg behind him It is too obvious a picture of the tropics and Mr Wallace reminds you of one of the early settlers. In some degree he resembles Mr. Sorabji Rutnagur perhaps a likeness that was reflected in more things than looks alone.

* Sorabji Rutnagur then assumed the office of

The Fiscal Commission under the chairmanship of Sir Ibrahim Rahimtoola issues its report. The editorial observes:

"It may be stated in a nutshell that the Report does not exhibit much partiality to the adoption of Imperial Preference though it is suggested that the principle may be applied in such a manner that India will not stand to lose anything thereby That is a sound proposition to make, because even in Great Britain the champions of Imperial Preference are but few, and their advocacy is more based upon considerations of what they are pleased to call Imperial solidarity than upon sound economics. The behaviour of several Colonies towards India has been consistently shameful and "It may be stated in a nutshell that the has been consistently shameful and has never betrayed the slightest consideration for the Imperial solidarity with reference to this country and, con-sequently, India is certainly not bound to accept a mischievous principle which to accept a mischievous principle which is being boomed by some political wise-acres solely in the interest of Colonial trade. Under these circumstances, the Commission is to be congratulated upon its refusal to advise the adoption of Imperial Preference. The main difference between the Report and the Dissenting Minute lies in this that the former advo-Minute lies in this, that the former advo-cates Protection with discrimination while the latter would apply it in hot haste.'

The Central Legislature considers the question of giving protection to steel. This is the Tariff Bill of 1924.

Then comes the crisis in the Indian cotton

Then comes the crisis in the Indian cotton industry.

"The situation is critical and 'something,' as is proverbially said, must be done. The labourers cry out that they cannot sacrifice their hard-earned wages; the millowners complain that, whilst they have done all they could to better the prospects of the industry, the Government has been placing them at the mercy of their rivals, not only actual but even potential ones. The exchange policy, the Excise duty and labour legislation, the solicitude of the Government for its

finances and revenues and for the workers have again and again been of service to the opponents of this country. The Government repudiate the idea that its policies are dictated by consideration for Britain or foreigners, but it ought to do 'something' to prove its assertion. If the industry cannot claim protection, it does at least deserve a fair chance and therefore it must be freed from the burdens imposed on it. At the same time it must be protected against the unequal competition of other countries by either inducing those countries to better their methods or by measures against their trade in this country. If their situation and their difficulties are not sufficiently understood there is no reason why the Government should not, as we have already suggested, investigate early. The cotton mill industry is in danger and must be saved."

A number of articles continue to appear month after month to stress the desperateness of the situation. One gets the impression that those must have been very trying days.

* * *

With the suspension of the Excise Duty on cotton manufactures the mill strike came to an end. The point that the *Journal* continually makes during the ten weeks of the strike is that there should be "a more direct intercourse between capital and labour."

A Tariff Board Inquiry into the condition of the cotton textile industry in India is set up.

Mr. R. D. Tata passes away in September 1926. The *Journal* says in an obituary notice:

26. The Journal says in an obituary notice:
"Quiet and unassuming in his ways
Mr. R. D. Tata has rendered invaluable
services to his country, and while his
name will remain closely associated with
the rise and progress of the House of
Tata, it will always be remembered
worthly by the commercial and industrial
communities of India."

To-day fourteen years after his death, his name and his work have not yet been forgotten.

October 1926 records the death of Sir Sassoon David, Bart.

* * * * was becomes Sheriff of Bombay.

* * * *
The Back Bay Inquiry is completed.

The Ratio controversy starts in the Legisla-

tive Assembly.

The Tariff Board find that the depression in the Indian textile industry is one phase of a trade cycle.

January 1928— another mill strike. In July of the same year the *Journal's* editorial reads:

"Though it is reported that one more attempt is being made to end the strike shortly, it is high time that the consequences of the prolonged mill strike in Bombay and the serious situation it has caused were realized by Government and the country. For over one hundred days a hundred and fifty thousand people have been idle, and losing about one and a half lakhs of rupees every day in wages and are now on the verge of starvation. Besides this sacrifice of Rs. 1½ crore and the suffering entailed thereby, it is also computed that the general trade of the city has lost about Rs. 3 crores."

The October issue reads:

"It is with a feeling of great relief and satisfaction that we are able to begin our thirty-ninth volume with the announcement of the happy termination of the longest and bitterest strike in the textile industry of India. So far as Bombay is concerned this event has been the end of an epoch, of a period of reconstruction. Speaking of the Bombay mills, we

may say last year the outlook in the industry was most despondent Government, despite the findings of their own Tariff Board, had declined to assist a struggling industry. The dividends which had vanished some years ago had not yet reappeared. The millowners were being asked to put their house in order and this they were doing. Expenses and expansions were rigidly curtailed and a forward policy was pushed on to explore further markets. The capital was drastically reconstructed, huge loans and paidup shares in large quantities being wiped off the balance-sheets. The cost of labour alone remained to be tackled. When this was attempted the strike broke out. Now that it is ended and work on a partially new basis has begun again, we look forward with hope to a new period. But the times we have been just through—five weary years of fruitless waiting, five years of losses—have, we all hope, come to an end."

Have they ? I wonder.

* * *

A series of articles on "The Bombay Mills' Staff" gives us an idea of the men who are working unnoticed behind the scenes of the great industry.

In January 1929 the Indian Textile Journal

In January 1929 the *Indian Textile Journal* changes its cover in response to a suggestion made by Mr Harold Hood, F.R.P.S. in *The Brutsh Printer* Mr. Hood had made the caustic remark:

"It puzzles me the more that so important and influential a trade journal as the Indian Textile Journal should be allowed to be dressed in so crude and ungainly a jacket as the cover represents."

From an article on "Journalism in India":

"Journalism in India has undergone a vast change in the course of the last generation. We have little now of the editor's personality in a paper or the enterprise of its news staff. News agencies have almost superseded the reporter, while the old-style editor is struggling hard against the business-like publisher who has his eye more on the balance-sheet than on the excellence of the leaders. And very soon the syndicated Press may make its appearance in the land and dominate all alike.

The struggles of the Indian journalist are severe even now We are no more in the days of Banneriee buying up the

The struggles of the Indian journalist are severe even now We are no more in the days of Bannerjee buying up the Bengalee for only rupees ten, cash down, or of Malabari, the Bombay social reformer, who had to deliver his own weekly in person to his few contributors or Mr. Chintamani writing, proof-reading and at the end copying out the addresses of every one of his subscribers on the envelopes, as he had only a peon for his staff. We have better resources at our disposal, but the results have not always been more successful. Journalism was in former times a vocation just as literature had been. It is now being commercialized, a tendency which the larger body of Indian journalists still persist in ignoring. Once they realize that the Press is to serve the public and not the journalist, that it is the public who pays and benefits and not the journalist, who only does his work to order, then alone journalism in India will prosper. Individual personality and opinion, however, need not be sacrificed. So long as men think independently there will be a medium for every editor to express his honest views undeterred by the voice of this master or that, for he can overthrow one to win over another."

The Journal enters into its fifth decade. And the volumes get bulkier.

The Whitley Commission on Labour comes to India.

The Journal, reflecting the mood of the industry, clamours for protection

"Mr." H. P. Mody comes into the limelight

and becomes a living force in the textile industry.

After the lapse of a number of years we hear again of "The Swadeshi Movement." This is an illuminating article It reads:

"The use of swadeshi (Indian-manufactured) goods has come to be regarded even by Government as an efficient means of encouraging and supporting the industries of the country, and every year we find an increasing proportion of indigenous stores being purchased for the requirements of the Government departments. In a similar manner, people too on their own account are getting into the habit of purchasing swadeshi goods, even at some sacrifice, though the process cannot be rapid, owing to the severe prices. This movement at the present juncture is of special significance, because it will assist the Indian cotton mill industry to dispose of its unsold stocks and future production more quickly than in the past, and it will also tone down the consumer's natural feeling of opposition to the new protective duty for the industry which might make the cloth dearer to him now.

which might make the cloth dealers of some now.

There are, however, certain points regarding this movement, which we desire to mention for the guidance of those who are actively engaged in it. It has been often found that the cry of swadeshi is heard in the cities and some towns, while the country-side, where real India lives, has remained practically uninfluenced. It is the smaller man, in fact, the cultivator, the village consumer, that in the mass swells the amount of total Indian consumption to such a high figure. His average requirements may be inconsiderable, but taken in the aggregate their importance cannot be exaggerated. Therefore, our village markets of cloth have to be organized to swadeshi ends. The activities of swadeshi workers should penetrate the villages, and should inspire the masses with the swadeshi spirit. In these endeavours, it is advisable that the manufacturers should co-operate with the swadeshi workers and should when possible finance the movement. We almost think that one of the great problems of the Indian mill industry is the organization of the markets in the country itself. The manufacturers should give special facilities to village traders in the matter of credit, etc., and should popularize their goods by a publicity campaign, while swadeshi workers should be assisted with funds to explain to the people the economic benefits of utilizing swadeshi cloth in place of the foreign. Whenever possible, small peripatetic exhibitions should be held in district towns and important villages.

should be neight in custifications and important villages. It would not be right, however, to forget that the crux of the whole problem lies in price. Lancashire and Japan have now both entered upon the new enterprise of reducing their costs by more efficient organization, and thereby cheapening their goods to the consumer. India should proceed to do likewise, for, if she lags behind in this respect, even the swadeshi propaganda carried on in the villages will not leave its permanent result on the country-side. Not only should the people in the villages be taught to give preference to swadeshi goods, but they should also be given the economic incentive of lower or at least equal prices gially for gialty.

goods, but they should also be given the economic incentive of lower or at least equal prices quality for quality

There is an impression abroad which we think does not disappear easily, that whenever the swadeshi movement in the country gets strong, the millowners as a rule take undue advantage of it, in the sense that they put up prices and reap thereby extraordinary profits. There is nothing wrong in the desire to earn profits, but if it is true that prices are unnecessarily raised, then as the sacrifice involved to the consumer is greater, it does not seem to be fair to him. What is necessary is that the manufacturer should also share in the spirit of patriotism that animates the consumer, in the general economic interest of the country."

And May 1930 gives us for the first time the word "Boycott." The Journal was of the opinion that "While

"While the swadeshi movement was patriotic and was bound to prove beneficial to the country, particularly to the industrial producers, the same could not be said of the boycott movement" "The boycott," it went on to say, "was based on hate and even Mr Gandhi does not like anything that is based on hate."

In November 1930 we note the Journal's comment on swadeshi

"The cult of swadeshi inaugurated in India has not been strikingly beneficial to the textile industry because of the attempts of interested parties to paralyse the cotton mills of Bombay by a series of arbitrary and invidious dictations. The latest of such dictations was the circular latest of such dictations was the circular issued to the Bombay millowners by Pandit Jawaharial Nehru, the President of the Indian National Congress, which we reproduce in another column A perusal of this document would show that for all of this document would show that for all practical purposes the Bombay mills should submit tamely and be bound in shackles to the dictates of a Committee consisting of Pandit Motilal Nehru and some people connected with the Ahmedabad industry. It also incidentally betrays to what extreme lengths some people would go in running the industry under the guise of promoting swadeshi. This dictation is being rightly resisted and ignored "

For the first time a picture of Mr. M. K. Gandhi appears. It is on the occasion on which an unknown labour leader attacked him and the Congress when Mr. Gandhi addressed the millhands at the Kamgar Maidan, Bombay.

Mr. Gandhı in Lancashıre.

A note of topical informality is struck by such articles as " Brevities."

September 1933 records, in a beautifully decorative manner, the historic conference at Simla known as the International Textile Conference. The editorial comment on it

reads:
"The abnormal complexity of the situation has seriously begun to dawn on those who are trying to grapple with the diverse and irreconcilable factors like diverse and irreconcilable factors like the quota system of exports, the reten-tion of the customs duties, the scaling of the currencies and the exporting of Indian cotton, and other trade require-ments. The initial private parleys in Bombay between Indian, Lancashire, and to an extent the Japanese representatives, were conducted admirably in an atmosphere of goodwill and mutual accommodation. The millowners from Bombay, Ahmedabad, Cawnpore, Baroda, Madras and other places were particularly impressed and even pleasantly surprised at the genial cordiality of the Chairman and members of the British Textile Mission which seemed different from the junkerism displayed by the uncompromising section of British diehards in recent times.'

Labour holds out the threat of another general strike.

Sir H.P. Mody retires from the Chairmanship of the Millowners' Association, leaving the memory of the Mody-Lees Pact to his credit.

The Bombay mill strike deepens in intensity. A striking picture of Mrs. Naidu appears addressing a public meeting at the Esplanade maidan. She said that "the Congress stood with the workers in their march to freedom.'

A provoking cartoon appearing in the Hindustan Times, drawn by Shankar, and headed "Who Sympathised with Labour?"

shows Sir H. P. Mody, Mr. N. M. Joshi and the police all claiming to have so sympathised. Meanwhile labour meekly returns to the mills. *

Sir Homi Mehta "admonishes" Mr Winston Churchill in the London Times The year is

W. B. Gilligan, I.C.S, Labour Officer, Government of Bombay, writes a first class series of articles for the Journal. From all accounts this I.C.S. official was quite out of the ordinary.

A public inquiry by the Special Tariff Board "regarding the level of duties necessary to afford adequate protection to the Indian Cotton Textile Industry against imports from the United Kingdom of (a) cotton piecegoods, (b) cotton yarn, (c) fabrics of artificial silk and (d) mixture fabrics of cotton and artificial silk."

The terms of reference were:-

To recommend on a review of present conditions and in the light of the experi-ence of the effectiveness of the existing duties, the level of the duties necessary to afford adequate protection to the Indian cotton textile industry against imports from the United Kingdom of (a) cotton piecegoods, (b) cotton yarn, (c) fabrics of artificial silk and (d) mixture fabrics of cotton and artificial silk. By adequate protection is meant duties which will equate the prices of imported goods to the fair selling prices for similar goods produced in India.''

George V passes away and the dynamic figure of Edward VIII steps on the scene.

Mr. F. E. Dinshaw passes away.

"It is a rare distinction," says the Journal, "for an eminent lawyer to be acknowledged as an eminent businessman and financier Mr. F. E. Dinshaw, whose death took place on the 3rd instant at Juhu, near Bombay, through heart failure, was esteemed as a leading lawyer and financier with a chentele that included landlords, bankers, millowners, capitalandlords, bankers, millowners, capita-lists, Indian princes, industrialists, public utility concerns and commercial and manufacturing organizations having exten-sive operations throughout India. His legal acumen was as keen as his grasp of the financial requirements and scope of indigenous manufactures with Indian labour and Indian resources, for which he was instrumental in influencing capital, the extent of which has never been equalled by any other Indian.

A strong-minded individual with a clear perception of the industrial and financial

needs of the country Mr. Dinshaw was able to help forward and revive many a director extended over the operations of nearly 80 joint stock companies few of which could be considered as unprofitable concerns."

Across the horizon appears the first signs of an Indo-Japanese rapprochement—to be effected by the Hon. Mr. T A. Stewart and Mr Kıkuji Yonezawa.

Sir Dınshaw Wacha passes away.

The Special Tariff Board signs and submits its report to Government.

From the editorial on "The Place of Khaddai":

"If the Congressites and their sympathisers wear khaddar as a symbol or as a ceremonual garb, we have no quarrel with them it is only when concerted attempts on an organized scale are made to glorify an out-of-date and obsolete method at the expense of the mill industry with lakhs of wage-earners depending on it, that one is constrained to raise the finger of warning. Ever since the time

prosaic cloth became identified, somewhat disconnectedly, as one of the levers of political emancipation, Mr. Gandhi had of political emancipation, Mr. Gandin had lifted the spinning wheel to the high pedestal with a child-like faith in its efficacy. For reaching the millennum he vehemently preached that *khaddar* alone could achieve that deceptive objective. In that process it seems nothing to fanatical khaddantes if the modern textile industry, nurtured to the present state by the investment of nearly one hundred crores investment of nearly one hundred crores of rupees, is decimated to enable the hand spinner to provide the sartonal needs of the largest population in any single country in the world. But such hopes are now obviously receding to oblivion. Pandit Nehru's pointed doubts about the economic utility of khaddar should now give the quietus. In a world robotised by the machine it is futile to resist the surge of mechanisation."

King Edward VIII abdicates.

And then comes the only black mourning that has appeared in the Journal since the death of Queen Victoria Sorabji Rutnagur passes away It is not necessary to say anything more than is said in the obituary on him written as it is in sincerity and with feeling. The obituary which is headed "A Farewell"

reads:

"As our Editor, he maintained the columns of this *Journal* at a level which compelled the attention not only of those are stated with the mill industry of India readers." but also of those numerous readers across the seas. His love for truth, his scross the seas. This love for that, his simple language, his straightforward, honest-to-God style of writing, won for him the respect of those who have turned over the pages of our *Journal*. He had great foresight and an unerring instinct of anticipating the future. For this he claimed no supernatural power, for he relied always on his own commonsense and his cool, clear, calculating mind. He showed even to the last a quick grasp, a precision, a thoroughness in business, which is difficult to emulate.

business, which is difficult to emulate. But to the many others who knew him outside the four walls of his editorial office, it was his simplicity that appealed most. He was a shrewd judge of men and character. In whatever way he could, he always helped his fellow men. The deserving, the dejected, the poor, the needy never left him without whatever comfort he could give. It is by these little acts of kindness that he will always be remembered. remembered.

remembered.

By nature he was a quiet and unassuming person. He never cared for the empty glamour of gatherings and social functions. He led a simple retiring life, and his greatest fortune was that he never desired wealth. He was never rich, but his pride

weath, he was never first, but his price and self-respect kept him away from entering into anybody's obligation. That was the man as we and so many others knew him. He was a gentleman to his finger-tips, an honest man who made no enemies and has left none. We see him still standing before us, this venerable figure, clad simply in plain clothes, with no flourishes, no stars or stripes, nothing except his personality to distinguish him from the rest of us."

That which appears in the remaining volumes is too recent to bear repetition. Somehow there is a pause after Sorabji Rutnagur's death which cries halt to these fifty years. It is his work that has now gone on for half a century, and one might with justification say that it was the monument he built for himself -- a monument of unstinted labour in the service of his country.

The mood of the day is not conducive to much rejoicing. There is gloom and despair in all that we see. Yet when one looks through these fifty volumes, one feels as if these words have appeared before and gone. In that hope does this Journal too face the years that are yet to come.

AMONG OUR ADVERTISERS

This section is based on notes supplied by the advertisers in this Souvenir, and the facts and opinions expressed in them are not necessarily curs. The list is also not a complete one as it does not include several prominent firms of long standing, whose advertisements are by themselves fully informative -ED.

Azam Jahi Mills Ltd. (Hyderabad State)

Situated at Warangal, the Azam Jahı Mıll situated at Warangai, the Azam Jah Minis built on modern principles and is equipped with the most up-to-date machinery. It commenced work in July 1934 with 19,944 spindles and 416 looms, and at present there are 428 looms. It has its present there are 428 looms. It has its own ginning and pressing factory and a dyeing, bleaching and finishing house. It produces grey, bleached and dyed single and folded yarns from 6 counts to 40 counts and manufactures cotton piecegoods of various kinds, grey, bleached and dyed. The mills are suppliers to H E. H. the Nizam's Government and the Indian Stores Department for war purposes.

Department, for war purposes.

The Secretaries, Treasurers and Agents of the mills are the Industrial Trust Fund, H E. H. the Nizam's Government, with Mr. Camar S. Tyabjee as Managing

Agent to them.

The registered office of the Company is at 159, Gunfoundry Road, Hyderabad (Deccan), and the Managing Agent's office is at Currimbhoy House, Outram Road, Fort,

Bombay. Cloth Selling Agents of the mills are the Industrial Trust Fund, H. E. H. the Nizam's Government, and the cloth shops are at the mill premises at Warangal and Nanded.

The Sub-Selling Agents are: Surendra Arvind & Co., Mulji Jetha Market, Govind Galli, Bombay, and 41-42, James Bazar, Secunderabad (Deccan)

David Sassoon Group, Bombay

David Sassoon & Co., Ltd. The beginning of this firm in India dates from the year 1832 when David Sassoon first visited Bombay and decided to make it his home. He ultimately became one of the most highly respected of its merchant princes and was ably assisted in his business by his two sons. A fact which is probably not well known to the general public is that the Sassoon Dock in Colaba was constructed by the firm in the year 1879, being the first

New Union Mill Ltd. This concern was founded in the year 1888 under the style of the Union Mill Ltd. It was taken over by the present managing agents in the year 1909 and in 1937 the name was changed to the New Union Mill Ltd. The loom shed contains 873 looms and there are 33,632 spindles This mill has a high reputation for

fancy goods.
Sassoon and Alliance Silk Mill Co., Ltd. was formed by the amalgamation of two separate companies in the year 1883; its purpose was the manufacture of silk yarn and cloth and many awards in public exhibitions have been gained by the mill's products. For the past ten or fifteen years the mill has had to change with the times and has turned over to artificial silk yarn as

Sassoon Spinning and Weaving Co., Ltd. was founded in the year 1874. For many years its manufactures, particularly grey goods, were well known in the Persian Gulf markets, but after 1921 export outlets were largely closed and the mill turned to the Indian markets. This mill has 1,288 looms and 60,240 spindles.

Delhi Cloth and General Mills Co., Ltd., Delhi

The Delhi Cloth and General Mills Co., Ltd., and the Indian Textile Journal are almost exact contemporaries. The Company was founded in 1889 by L. Gopal Rai, a scion of the well-known Kotwali family of Delhi and uncle of L. Shri Ram and L. Shankar

The history of the 50 years of the Company's life reads like a romance. The paid-up capital of the Company has risen from just under Rs. $5\frac{1}{2}$ lakhs to almost Rs. $1\frac{1}{2}$ crores, the value of machinery from a little over Rs. 4 lakhs to nearly Rs. 1 crore, the value of stock in hand from Rs. 1½ lakhs to nearly Rs. 1¼ crores, the volume of annual sales from just under Rs 2 lakhs to Rs 2 35 crores, the amount of annual profits from below Rs 20,000 to nearly Rs. 36½ lakhs, the annual consumption of cotton from 9,000 maunds to $3\frac{1}{2}$ lakh maunds, the salaries and wages from Rs. 37,000 to Rs 41½ lakhs, and the number of men employed from Mill was added in 1925 with 20,000 spindles and 600 looms; and three years later came the addition of No. III Mill with another 20,000 spindles and 500 looms.

The manufactures include not only the usual fabrics which are popular in the Indian market, e.g., saries, dhoties, mulmuls, drills, twills and coarser kinds of cloth but also fine shirtings, handkerchiefs and turkish towels the finish and quality of which mark a milestone in indigenous industrial development. We are informed that the mills produce tapestries which, though cheaper, vie in beauty and colouring with some of the best of Continental manufactures.

The mills have an offshoot in the cotton mills at Lyallpur, and own and control sugar factories at Daurala in the Meerut District, and at Barhni in the Gorakhpur District,

in the United Provinces
An outstanding feature of the Company lies in the cordiality of the relations between the management and labour. The Company has made it both a privilege and a duty to serve its workers only next in order after the consuming public. The wages of atter the consuming public. The wages of its workers, we are informed, are not only higher in comparison with local mills but also compare favourably with the wage-levels that obtain in the more important industrial centres of India Labour has a representative on the Board of Directors and there is a scheme by which it shares in the profits. in the profits.

Lakhshmi Cotton Manufacturing Co., Ltd., Sholapur

The Lakhshmi Cotton Manufacturing Co., Ltd , is situated at Sholapur (Deccan), about 270 miles east of Bombay It was started in

The mill has 45,792 ring spindles, 4,300 doubling spindles and 1,341 looms and employs 3,100 labourers. It is fitted with the most up-to-date dyeing, bleaching and yarn printing machinery. Its manufactures cover a large range of yarns and fabrics which are popular in markets both at home and

Managing Agents: The Bombay Co., Ltd., Wallace Street, Bombay.

Model Mills, Nagpur, Ltd.

This Company was floated on the 12th of August 1920 in order to establish a large spinning, weaving, dyeing and bleaching mill in Nagpur with modern and labour-saving machinery. The city of Nagpur was specially selected for the construction of this mill as the surrounding districts provide at once a large, ready and expanding market for the yarn and manufactured cloth and immense facilities for the purchase of raw materials. There is also a plentiful supply of cheap and suitable coal for industrial purposes.
This mill started work in October 1923 with

about 40,000 ring spindles, 1,020 looms and

a well-equipped dyeing, bleaching and finishing plant. Subsequently, in 1924, 12,408 more spindles were added, together with all note spinites were actived, together with an necessary auxiliary blow room, card room and preparatory machinery. This mill, when working in full swing with an equipment of 52,408 spindles and 952 looms and the dyeing, bleaching and finishing plant, provides livelihood for nearly 3,000 people single shift.

provides invelniced for hearry 5,000 people, single shift This Company has an issued capital of 40,000 ordinary shares of Rs. 250 each, amounting to Rs. 1,00,00,000, and is working with capital, reserves and loans aggregat-ing Rs. 151 lakhs. It has over a dozen agencies for purchasing cotton and more than 18 centres for the sale of its manufactures all over the country.

Navjivan Mills, Ltd., Kalol

The Navjivan Mill is situated at Kalcl m the Gaekwar territory near Ahmedabad The Managing Agents of the mill are Messrs. Rustomjee Mangaldas & Co., who are also the Managing Agents of two mills in Ahmedabad and one mill at Bhavnagar. The Navjivan Mill was started in Bhavnagar. The Navijivan Mill was started in 1931 with entirely new and up-to-date machinery on a very moderate scale. At the outset there were about 15,000 spindles and 325 looms and the plant was meant for the manufacture of cloth from medium and fine counts only. The entire machinery is also counts only. The entire machinery is also run by electric power produced from the mill's own turbo-generator and high pressure water-tube boilers. It is now a full-fledged mill with 22,000 spindles and 504 looms with complete dyeing, bleaching and finishing plants. The mill has also installed combers and is making fine fabrics from Equition combed. ing fine fabrics from Egyptian combed yarn. Its products are well known in the Karachi, Amritsar, Calcutta, Bombay and South India markets. Its specialities are jacquard-border saries, poplin, longcloth, dorias and fine mulls. The financial condition of the mill is improving from year to year and though the original paid-up capital of the mill was Rs 7 lakhs and the capital expenditure of the block is now over Rs 23 lakhs, there is practically no capital debt The latest addition to the mill is a department for making sewing threads which is known as Bharat Thread Works. It is producing different varieties of sewing threads required in the market by the public

as well as by the Government. New Pralhad Mills Ltd., Bombay

The New Pralhad Mill is situated in Bombay and is equipped with 33,096 spindles for ring spinning, 1,040 spindles for mule spinning of low counts and 360 spindles for waste spinning. The weaving section has over 1,000 looms and the cloths produced range from coarse waste blankets and heavy canvas to fine white bleached shirtness. shirtings.

In addition to grey yarns the mill can supply bleached and coloured yarns. Arrangements can also be made to supply mercerized yarns and printed yarns. Yarns upto 40s counts are produced

Managing Agents—The B.M.D. Agency
Ltd., Wallace Street, Bombay.

Osmanshahi Mills Ltd. (Hyderabad State)

Situated at Nanded, which is the centre of important cotton-growing areas in the Nizam's Dominions, this mill commenced work in 1925 with 16,652 ring spindles and 396 looms, but it was later extended and is at present equipped with 24,708 ring

spindles and 469 looms, including 40 automatic looms of Platt's Toyoda make Further improvements were made in 1932 when steam power was changed over to electric power by the installation of a turbo-generator

The mill has its own ginning and pressing factory in the premises. It produces a variety of single and folded yarns, grey, dyed and bleached, from 6 to 40 counts, and grey, bleached and dyed piecegoods of various kinds

The mills are suppliers to H.E H. the Nizam's Government and the Indian Stores Depart-

ment, for war purposes.
The Secretaries, Treasurers and Agents of the mills are the Industrial Trust Fund, H E. H. the Nizam's Government, with Mr. Camar S. Tyabjee as Managing

Agent to them.

Agent to them.
The registered office of the Company is at 159, Gunfoundry Road, Hyderabad (Deccan), and the Managing Agent's office is at Currimbhoy House, Outram Road, Fort,

Bombay.
Cloth Selling Agents of the mills are the Industrial Trust Fund H. E. H. the Nizam's Government, and the cloth shop is at the mill premises at Nanded.

The Sub-Selling Agents are Surendra Arvind & Co., Mulji Jetha Market, Govind Galli, Bombay, and 41-42, James Bazar, Secunderabad (Deccan)

Savatram Ramprasad Mills Co., Ltd.,

Nearly half a century ago, there existed a small ginning factory on the east bank of the river Morna in Akola. It has grown to a complete textile plant wherein all the processes from ginning to the manufacture of finished cloth are now carried on.

finished cloth are now carried on. In the year 1911 the plant consisting of 60 gins, 2 presses, 7,000 spindles and 125 looms was purchased by the Savatram Ramprasad Mills Co., Ltd Seth Onkardas Ramprasad, the then owner of the Savatram Ramprasad firm, was the first managing agent. After his death in 1915, the management was taken up by his widow, Smt Kasturibai, who set the concern on the path of procress Seth Kisanlal Onkardas, the Kasturibai, who set the concern on the path of progress Seth Kisanlal Onkardas, the present Managing Agent, took up the reins in the year 1932. Under his guidance and management the mill has made great progress. The mill machinery, though some of it has been purchased second-hand, yields good production. The original cost of the buildings and machinery was Rs. 3,80,000 and to-day the same (without considering depreciation) is nearly Rs. 23 lakhs. In addition to this the Company has declared a dividend of 18 per cent. for the last three years in succession

To-day the whole plant consists of machinery kept up-to-date and on scientific limes. The spinning department is fitted with a system of Bahnson's Humidifiers and nine ring frames have been converted into the

ring frames have been converted into the Casablancas High Draft System with twin sliver motion. Efficiency methods are employed to get maximum work.

Shree Niwas Cotton Mills, Ltd., Bombay

The former Fazullbhoy Mills Ltd., of the old Currimbhoy Group, was bought in October 1934, and started under the new name "The Shree Niwas Cotton Mills Ltd." The Marwar Textiles (Agency) Ltd. are the Agents for this mill.

The mill when bought had 52,296 spindles, and 10,420 spindles were added in 1937, bringing the total to 62,716. The new ring spinning frames are of 4-roller high draft, and Casablanca type, with individual motor drives. Eighteen new carding engines were added in 1938 and the entire new blow-room plant of modern type with individual motor drive was installed in 1939.

The mill had originally 1,992 looms The entire weaving shed was reorganized, narrow looms were taken out, and many narrow width looms widened. A number of new dobbies and jacquards were added, and to-day they have an up-to-date weaving shed from 32 ins. to 100 ins reed space of total 1,906 looms.
The old mill had no dyeing or bleaching

department of its own The present agents therefore erected, in 1936, an up-to-date

dyeing, bleaching, finishing and calico printing plant of modern design. The cloth bleaching capacity is 15,000 lbs per day and the dyeing capacity 2,500 lbs per day. Yarn dyeing capacity is 4,000 lbs per day. The results obtained have been highly satisfactory. Large varieties of cloth are manufactured by this mill, and its fine and fancy goods have an established reputation in the different markets of India. Its speciality is fine bleached longcloth which is said to is fine bleached longcloth which is said to be quite popular in the country. It has even manufactured mineral khaki drills, although it has no proper khaki dyeing plant.

Tata Group of Mills

The Empress Mills, Nagpur, as the factories of the Central India Spinning, Weaving and Manufacturing Co., Ltd., are called, were the first of the Tata Mills and they were opened in 1877 with 15,500 throstle frames, 14,400 mules and 400 looms The first commercial production of ring-spun yarns was achieved at the old Empress Mills At present the mills contain 115,000 spindles, 2,160 the mills contain 115,000 spindles, 2,160 looms, a bleach and dye-house and a printing plant as well as gins and presses in the cotton districts. The labour force comprises 8,000 hands on day shift and 2,600 on night shift. The second mill of Tatas was the **Svadeshi Mills** founded in 1886 at Kurla, near Bombay. By 1906 Svadeshi yarns were the standard commodity on the Levant in competition with the expert spinners of Austria and Italy. To-day the Svadeshi Mills have 79,000 spindles and 2,150 looms, employ 4,000 hands and have a complete employ 4,000 hands and have a complete dye and bleach house and printing plant The next mill acquired by Tatas was the Ahmedabad Advance which consists of 44,224 spindles and 1,016 looms, and has a staff of 1,800 workers

The Tata Mill, Bombay, started work in 1918. It runs 62,368 spindles, 1,800 looms and a dye and bleach house, and has a payroll of 3,000

The mills under the Managing Agency of Messrs. Tata Sons Ltd. manufacture all varieties of yarns and cloths Coarse, fine, fancy, grey, bleached, dyed and printed goods find their way to all the markets of India through their selling agents who have shops in the principal markets

The following figures will indicate what the Ahmedabad Advance, Empress, Svadeshi and Tata Mills mean to the House of Tata.

T/D.
5,37,00,000
27,000
70,00,000
2,40,00,000

Vijaya Mills Co., Ltd., Ahmedabad

The Vuava Mills Company, Ltd. The Vijaya Mills Company, Ltd., was started in 1931 with an authorized capital of Rs. 10,00,000 consisting of 10,000 shares each of Rs 100, the issued capital being Rs. 7,00,000 from the very beginning. During its working of only nine years the mill has been able to build up depreciation funds of Rs. 11,72,054 and other funds of the aggregate amount of Rs. 3,19,709. The Company has been able to earn profits year after year and has been paying dividends to its shareholders from the very first year of its working The management of this mill has been vested in the hands of Sheth Haridas Acharatlal, ex-President of the Ahmedabad Millowners' Association, and his three sons The eldest son, Sheth Nanddas Haridas, the present President of the Ahmedabad Millowners' Association, handdas nations, the Absociation, and his brothers, Sheth Charandas Haridas and Sheth Chinubhai Haridas, who have visited most of the industrial centres in Japan and have wide knowledge of the textile industry, are helping their father in the day-to-day management of the mill. To-day, the mill is one of the foremost mills in Ahmedabad though manufacturing mostly medium counts. Last year the management installed an up-to-date printing plant which is working satisfactorily. Their cloth has, owing to its uniform quality, been well known in the market. One of

their special productions of bleached long-

cloth, known as No. P 11, which has been in the market from the beginning, is

highly popular.
There are 22,884 spindles and 658 looms in the mill The mill is working two shifts.

Vikram Mills, Ltd., Ahmedabad

The Vikram Mills, Limited, Ahmedabad, established in 1929, started functioning with up-to-date machinery, and at present is one of the leading textile mills of that centre. It has the latest blow-room machinery, and the spinning section contains 26,412 spindles, which work day and might The weaving section has 1,052 looms, which produce cloth of coarser and medium counts. In the year 1938, an up-todate printing plant was installed, and the mill was awarded gold medals for its cloth at the exhibitions held at Madras and Ujjain. The progress of the mill is being continued and the authorities have further

continued and the authorities have further ordered out a combing plant which is shortly expected

The capital of the mill consists of Rs. 10,00,000, divided into 10,000 shares of Rs 100 each, out of which 5,000 shares of Rs 100 each have been issued and fully subscribed The mill has upto the end of 1939, distributed Rs. 81-8 as dividend, which is noteworthy.

Sheth Ramanial Lallubhar, who is the agent

which is noteworthy. Sheth Ramanial Lallubhai, who is the agent and guiding spirit of this mill, is well known for his far-sighted policy and economic management of the mill. His eldest son, Sheth Natvarlal, ably assists him in the management of the mill.

Vishnu Cotton Mill Ltd., Sholapur

The Vishnu Mill is situated in Sholapur (Deccan), about 270 miles east of Bombay. It was started in 1910.

The mill has 51,940 ring spindles, 5,528 doubling spindles and 1,465 looms The number of labourers employed is 3,300. The mill has an up-to-date dye-house and yarn printing machinery

Both Indian and imported cottons are used and counts are spin from 6s to 60s.

and counts are spun from 6s to 60s.

Its products cover a wide range of yarns and fabrics which are popular in all home and many overseas markets.

Managing Agents:—Messrs. The Bombay Co., Ltd., Wallace Street, Bombay.

Ahmedabad Electricity Company Ltd.

The most striking advance in the use of electricity in Ahmedabad of recent years has been in the field of industrial power supply. The textile industries are taking increasing advantage of the superiority of electric drive for all kinds of superiority of electric drive for all kinds of machinery and more and more mills and factories are taking power from the Ahmedabad Electricity Company Ltd. on account of its cheapness and reliability. The Company was formed in 1913 with its headquarters in Bombay under the agency of the well-known firm of Killick Nixon & Co. The original power station had three 94-kw. The original power station had three 94-kw, generators driven by Diesel oil engines and commenced operations in February 1915. Considerable difficulty was experienced in obtaining plant and delivery of materials during the years of the Great War (1914-18) which retarded the Company's progress. However, in spite of war and other adverse factors, the Company expanded its activities and in 1918 the plant was leaded to the full actors, the Company expanded its activities and in 1918 the plant was loaded to its full capacity and the Company had to notify its mability 'o supply additional applicants. In 1921 two 162-kw. Diesel sets, ordered from England in 1918, were received and three more of the same capacity were from England in 1918, were received and three more of the same capacity were installed in 1923, the three original 94-kw. sets being sold to make room for the larger machines. During these years the Ahmedabad Municipality had been very active in adding to the number of roads hit by electricity and the consumption of energy by the public continued to increase steadily. An extension to the power house building was made in 1924 and three 500-kw. Diesel sets were installed in 1924-25, bringing the total plant capacity to 2,310 kw. bringing the total plant capacity to 2,310 kw.
The Company was now able to extend supply into many more localities, including the right bank of the Sabarmati, where residential suburbs were springing up. In order to

cope with the ever increasing demand for supply, a 600-kw set, the largest which could be conveniently accommodated in the power station, was added in 1929, and by 1932 the lack of space to install further plant in the power station to meet newer demands for generating power led to the erection on a site near Sabarmati of an entirely separate power station equipped with steam turbo-alternators. This new station with two sets of 3.750 km, each was with steam turbo-alternators. This new station with two sets of 3,750 kw. each was commissioned in November 1934, giving an initial plant capacity of 7,500 kw as compared with 2,910 kw. at the Diesel power station. The advent of the steam station made it received to introduce the for long to the steam.

possible to introduce tariffs for large industrial concerns at attractive rates and rates and trial concerns at attractive rates and several textile mills immediately began to take power in varying quantities from the Supply Company. It was also possible to quote, owing to the lower cost of production at the steam station, more favourable rates to the Municipality and the consuming public, and the minimum charge was removed altogether with the result that the amenities of electricity were brought within reach of almost the humblest purse. reach of almost the humblest purse. Since the erection of the steam station the

consumption of electricity for all purposes increased to such an extent that a 7,500-kw turbo generator set was installed in 1936 and another of the same capacity early in 1939, bringing the total capacity early in 1939, bringing the total capacity of the station to its present figure of 22,500 kw. A further 7,500-kw. set was ordered in 1939, but it has so far not been delivered and considerable delay is likely

considerable delay is likely
A few statistics may be of interest. There are
18,000 consumers connected to the system,
221 miles of street are illuminated by 7,714
street lamps, 28 mills and factories are
taking supply With regard to sales of
energy for independent power purposes, the following table is of interest:

Yeaı	Kw con- nected	No	Sales	Increase over previous year
			Units	Per cent.
1934-35 1935-36 1936-37 1937-38 1938-39 1939-40	1,517 2,417 4,052 6,759 11,429 14,412	7 11 12 17 24 28	3,355,574 6,738,280 9,245,122 15,172,276 26,772,438 36,749,731	64 11

In conclusion, mention may be made of the future of electric supply in Ahmedabad. In so far as the development of the use of electric power in the textile industry is concerned, we are informed that millowners are appreciating the advantages to be derived from "purchased power" As regards small industries and lighting As regards small industries and lighting and fan consumers, it has always been the policy of the Ahmedabad Electricity Co, Ltd, to encourage to the fullest extent the many uses of electricity, and it is felt that the abolition of the minimum charge coupled with successive rate reductions makes it possible for any consumer, no matter how small his needs, to avail himself of electricity.

Apollo Engineering Co., Apollo Street,

Established about two decades ago, they specialize in textile machinery and hold a number of overseas agencies. They handle mather of overseas agencies. They had also dyestuffs, chemicals and sizing materials. They have equipped (also erected in some cases) a number of dyeing, finishing and printing houses, and also bleacheries.

Asea Electric Ltd., Ballard Estate, Bombay

Messrs Asea Electric Ltd are well known in Messrs Asea Electric Ltd are well known in textile circles in this Country, having been established in India for over 20 years. They have specialized particularly in cotton mill electrification and humidification and their plant is to-day operating in no less than 161 Indian mills. The Company maintain a number of specialist engineers in both Bombay and Calcutta and they are in a position to give expert advice on any electrical or air-conditioning problem. They further have available in India a large and fully qualified "Home-trained" erecting staff, capable of dealing with all branches of the heavy electrical industry, and the progress which has been made by this concern of recent years is an indication of the service which they have always the service which they have always rendered to users of their equipment The Bombay office of Messrs. Asea Electric Ltd. is at Feltham House, Graham Road, Ballard Estate, and their Calcutta office is at Sassoon House, 4, Lyons Range.

Associated Textile Engineers. Forbes Street, Bombay.

Kaolin or china-clay is extensively used by Kaolin or china-clay is extensively used by textile mills, paper mills and potteries, and also in the manufacture of paints and pigments, cosmetics, soaps, rubber, etc. India has been so far importing china-clay to the tune of about Rs. 25 lakhs per year It was, however, recently found that this country was rich in china-clay deposits, although one or two early attempts at proalthough one or two early attempts at pro-ducing the right type of textile clay had failed Important progress, therefore, was made in the year 1939 when the Govern-

ment of Travancore started their china-clay refining plant at Kundara.

The geological survey of Travancore State revealed the existence of large china-clay deposits and the Government sanctioned the necessary investment for designing and making the necessary refining plants and equipping their factory with up-to-date and equipping their lactory with up-to-date and efficient machinery on a sound commercial basis. They started marketing their product in this country through their Sole Agents, Messrs. The Industrial and Agricultural Messrs The Industrial and Agricultural Engineering Co, Bombay, in the beginning of the year 1940, and the support given by the Indian textile industry is reported to have been so encouraging that the Government have sanctioned the putting up of additional refining plants for increasing the volume of output

Travancore china-clay is primary clay and the refining plant which is built on the latest the refining plant which is built on the latest approved principle of levigation and flotation ensures purity of the product. It is said to be free from grit, iron, or other injurious constituents and it compares favourably, they say, with other clays in chemical composition and physical constitution Travancore china-clay has high qualities of absorption and adsorption and, therefore, makes a good paste which in turn makes a strong and pliable yarn on the beam. The Sole Distributors are Messrs. Associated Textile Engineers, 43, Forbes Street, Bombay. Street, Bombay.

Batliboi & Company, Forbes Street, Bombay

Founded in 1892 by the late Mr. Jahangirjee Framjee Batliboi, this firm successfully handled the Agency of Messrs Richard Hornsby and Son, Lincoln (England), manufacturers of oil engines These engines were supplied throughout India and earned a good name for the Company and credit to the head of the firm in those old days Several ginning factories, balling presses, etc., were also built by the firm in this country.

country.
In 1916, Mr. J F. Batliboi retired from the business and the firm was taken over by the present proprietor, Mr Bhogilal Leherchand Zaveri. The business which was, however, conducted on more or less the same lines as before, has rapidly expanded since then and to-day possesses more than fifty English, American and Continental agencies.

The firm deals in various kinds of machinery including machine tools like lather

The firm deals in various kinds of machinery including machine tools like lathes, drilling machines, shaping machines and milling machines, crude oil, kerosene and petrol engines, wood working machinery, rubber and hair beltings of various kinds, electrodes of various kinds, fractional h p. belts, cog belts, and pumping machinery; also, agricultural and structural machinery; textile printing rollers, pharmaceutical machinery, oil, flour and rice mill machinery, saw mill machinery, sheet metal machinery, utensils, etc.—making machinery, gold and silversmiths' machinery, welding plants, stone breakers, mixers, etc., paint mills machinery, bone crushing

machinery, coffee mill machinery, printing press machinery, electro-plating, chromium-plating and lacquering machinery, dairy machinery and art and crafts machinery. Of late, the firm has been importing a wide range of industrial machinery from Japan suitable for textile industries, such as tape

suitable for textile industries, such as tape looms, braiding machines, winders, rope-making machines, narrow fabric looms with jacquard, etc.

The firm has branches in Bombay and Madras and has agents in almost every province of India. It keeps large stocks in Bombay and other branches for immediate delivery. They are among the suppliers to the I. S. D., Railways, etc. The Managers of the firm have made extensive business tours of Europe, U.S.A. and the East.

and the East.

Bharat Starch and Chemicals Ltd., Calcutta

The progress achieved by Bharat Starch and Chemicals Ltd. since its establishment is commendable. It is the first company in India, we are informed, to manufacture on a large scale maize starch and its allied products It was floated under the able manage-ment of Messrs. Karam Chand Thapar & ment of Messrs. Karam Chand Thapar & Bros., Ltd., 5, Royal Exchange Place, Calcutta, whose activities in the industrial and commercial fields are well known. Besides the starch factory, they have under their management sugar mills, paper mills, dry ice factory, an insurance company, a number of collieries and several other commercial lines. The Starch Factory is situated at Jagadhri (N.W.R.), near Saharanpur, in the heart of the maize-growing districts, and the daily grinding capacity of the factory is 14 tons of raw material. Since February 1938 when they started regular manufacturing operations, they have placed on the market a range of products of high quality, including maize starch (pearl and powder), thin boiling starches, placed on the market a range of products of high quality, including maize starch (pearl and powder), thin boiling starches, soluble starches, dextrine, wheat starch, salad oils, corn flour, etc.
Lala Karam Chand Thapar, a well-known industrial magnate of Calcutta, is the Charman of the Board of Directors which includes business men of repute like Lala Shri Ram of Dalby.

of Delhi.

W. H. Brady & Co., Ltd., Bombay

This firm was started in Bruce Lane, Fort, in 1895, under the style of Bradbury Brady & Co, by Mr J. F. Bradbury and Mr. W. H Brady, two of the best known mill managers of the time. Mr. Bradbury had been connected for several years with the Lakhmidas Mills (now the Dawn), Bombay, while Mr. Brady had acquired his reputation by the successful management of the David Mills. successful management of the David Mills. Messrs Bradbury Brady & Co. made the initial start about the period when cotton mills were on the increase, and their practical knowledge of mill management and machinery helped considerably towards the firm's progress. In addition to the business of machinery importers this firm started the Empire David

In addition to the business of machinery importers this firm started the Empire Dye Works in 1900 and took up the agency of the Colaba Land and Mill Company in 1901. This was followed by the agencies of the New City of Bombay Mills, the New Great Eastern Mills, the Sun Mill (now Dhanraj Mills) and the Bradbury Mills A change was, however, made in 1912 when Messis. Bradbury and Knowles (who had been admitted as a partner in 1895) restricted their business as agents of these mills under the style of Bradbury & Co., while Mr. Brady their business as agents of these mills under the style of Bradbury & Co., while Mr. Brady started business in the same year as a machinery agent with Mr (now Sir Joseph) Kay, Mr. Lakin and Mr Johnson as junior partners, under the style of W. H. Brady & Co., which was formed into a joint-stock concern in 1913. On the death of Mr. Bradbury in 1916, the agencies of the Empire Dye Works, New City of Bombay Manufacturing Co., Ltd., New Great Eastern Spinning and Weaving Co., Ltd., and the Colaba Land and Mill Co., Ltd., were transferred to Messrs. W. H. Brady & Co., Ltd. On the retirement of Mr. Brady in 1922, Sir Joseph Kay was appointed Managing Director of the firm and its progress under his management has been considerable, as his management has been considerable, as in addition to the import of cotton mill

machinery they have extended their operations over other classes of factories such as sugar, printing and other industrial concerns. Their present agencies for jointconcerns. Their present agencies for joint-stock concerns include the following:— The Colaba Land and Mill Co., Ltd., the New City of Bombay Manufacturing Co., Ltd., the New Great Eastern Spinning and Weav-ing Co., Ltd., the Bombay Industrial Mills Co., Ltd., the Empire Dyeing and Manu-facturing Co., Ltd., and G. Claridge & Co., Ltd. Ltd.

In addition to their close connection with the cotton textile industry, Messrs. W. H. Brady & Co, Ltd., have a very large general Engineering Department and they carry comprehensive stocks of the products of a number of British firms who are recognized as makers of the highest repute, amongst whom may be mentioned Messrs. Hopkinsons Ltd of Huddersfield, Herbert Morris

sons Itd of Huddersheld, Herbert Morris Ltd. of Clasgow, the Renold and Coventry Chain Co., Coventry, the Hoffmann Manufacturing Co., Ltd., Chelmsford, etc. The Textile Machinery Department includes such agencies as William Tatham Ltd. of Rochdale, who have a world-wide reputation for all kinds of waste plant and who also specialize in the manufacture of wool and worsted cards. The Universal Winding Co of Providence, R.I., U.S.A., is another important textile agency. This Firm also of Providence, R.I., U.S.A., is another important textile agency. This Firm also has a very high reputation in the textile industry, being the patentee of the "Leesona" Winding Machines. In addition, Messrs. W. H. Brady & Co, Ltd, are the Managers of the Belapur Co, Ltd., a pioneer amongst sugar factories in India growing the whole of their cane crop themselves. This concern is self-contained and has the reputation of being one of the most successful of its kind in India.

The head office of Messrs. W. H. Brady & Co., Ltd., is in Bombay, and they have

& Co., Ltd., is in Bombay, and they have branches in Ahmedabad, Calcutta, Cawnpore, Madras and Manchester.

Brotherton & Co., Ltd., Leeds, England

The business was founded at Wakefield, The business was founded at wakened, England, in 1878 by the late Lord Brotherton of Wakefield, D.L., LL.D. (then Mr. Edward A Brotherton). The business flourished from the commencement, and in flourished from the commencement, and in 1882 an ammonia distillation works at Holmes Street, Leeds, was acquired. Six years later, in 1888, a tar distillation plant was commenced at Stourton, Leeds. As the business increased it became necessary to acquire additional premises, and in 1893 a large works was secured at Birmingham for the distillation of ammonia and the manufacture of sulphuric acid

manufacture of sulphuric acid
Early in the present century further works
were acquired in Liverpool (tar distillation),
and in Glasgow and Sunderland (tar and
ammonia distillation), and in 1913 a tar
distillation and sulphuric acid works was
erected at Workington.
In 1917, Lord Brotherton purchased from
the Board of Trade, by public auction, the
Mersey Chemical Works, Bromborough,
Cheshire, a factory formerly owned and
worked by a combine of important German
colour firms. By the acquisition of this
factory Lord Brotherton realized his ambition to complete the range of manufactures tion to complete the range of manufactures from coal-tar to dyestuffs in his own fac-

tories The Mersey Works also makes an important range of hydrosulphites, and a very large plant was installed for the manufacture of liquid sulphur dioxide, and for a range of

liquid sulphur dioxide, and for a range of sulphues and bisulphues.

The firm's products include:—Hydrosulphue of Soda, used extensively by the textile industry as a reducing agent in dyeing; Formosul, utilized chiefly by the calico printing industry; Dyestuffs, used in every class of the textile industry. It was always a point with Lord Brotherton that a happy relationship should exist

It was always a point with Lord Brotherton that a happy relationship should exist between employee and employer, and he fostered this ideal by making himself accessible to his workpeople, in order that he might see things from their point of view. This tradition is followed by the present Chairman of the Board of Directors, Mr. Charles Brotherton, J.P., who is a typical instance of the Yorkshire business chief who puts the force of his own personality into the work of his organization. lity into the work of his organization.

Besides the Leeds head office, the Company Besides the Leeds head office, the Company has agencies in all parts of the world, as well as offices in London, Liverpool, Manchester, and Glasgow. Their Agents for India are Imperial Chemical Industries (India) Ltd., Calcutta, and stocks are carried in Bombay, Calcutta, Madras, Cochin, Colombo, Rangoon, etc.

Chirimiri Colliery

Chirimiri Colliery is situated in the **Korea State** This coalfield has been newly discovered and abounds in coal of very superior quality About 1922 Sir Maneckji Dadabhoy was prospecting in this new field and employed a mining engineer to find out if there was any coal in the area Through the enterprise of Sir Maneckji rich coal deposits were proved to existin several hills and, about 1929, Sir Maneckji started the present colliery on a small scale, near the village of Chirimiri. The population of this village at that time was not more than 20 but now it boasts of a population of about 15,000 souls including colliers, workmen, staff, shopkeepers, traders, etc. Natural advantages together with the good quality of the coal and the splendid seam have changed Chirimiri from an obscure hamlet into a well-known centre of coal production.
Within ten years this colliery has been able winn ten years this colliery has been able to raise over half a million tons of coal annually. This coal is of superior quality and the late Chief Mining Engineer, Mr. Whitworth, is reported to have stated that he would have put the coal in the list of graded coals had the colliery been situated in British India. ın Brıtısh India.

Before starting the colliery, Sir Maneckji Dadabhoy had to arrange for the extension of the railway line to Chirimiri from Anuppur, a distance of about 54 miles The railway authorities were sceptical about the ultimate success of the enterprise and of the earnings to be got from the traffic, but subsequent events have more than justified the laying out of the new line and the railway is

laying out of the new line and the railway is now earning a very substantial income from the coal traffic from this field. The success of Chirimiri Colliery has been great and every year it has shown considerable improvement both in the quantity of coal produced and sold and the sale proceeds received. It has not yet reached its full development and production capacity and in future years it is, therefore, bound to occupy an even more important place amongst the coal-producing centres of India than at present.

Ciba (India) Ltd., Sprott Road, Ballard Estate, Bombay

Ciba (India) Ltd was incorporated as a private limited company in June 1928. This ear saw the beginning of a really serious effort to cater for the requirements of the textile and allied industries of India. Since that time the activities of Ciba (India) Ltd. have been continuously expanding and the services rendered to their customers have services rendered to their customers have been increasing year by year. To-day a competently managed and able staff is distributed throughout the length and breadth of the country.

The products sold by Ciba (India) Ltd. are those inanufactured by the Society of Chemical Industry in Basle and allied and the Livid States of

works in England and the United States of America The general excellence of the qualities of colours and chemicals offered has led to their rapid adoption, and colours imported by Ciba (India) Ltd. are to-day to

be found in many mills in India
The development of the Company in India The development of the Company in India has been due to an enlightened and progressive policy, attending promptly to customers' requirements, selling only high quality products and being always ready to give the best technical assistance possible. Even to-day, in these difficult and trying times, Ciba (India) Ltd. are trying their best to procure for their customers adequate maintities of suitable divertiffs and have best to procure for their customers adequate quantities of suitable dyestuffs and have, to a considerable degree, been able to fulfil the requirements of their customers. Though it is impossible to forecast the trend of events in the near future, Ciba (India) Ltd. believe that they will continue to be successful in securing substantial

quantities of suitable dyestuffs for their clients in the textile and allied trades. Since January, 1935, Ciba (India) Ltd have also been looking after the interests of also been looking after the interests of another leading Swiss firm in the manufacture of dyestuffs, namely, Messrs J. R. Geigy S.A., whose products are already well known. Consumers in India appreciate Messrs Geigy's reputation as manufacturers of Chrome Printing colours and pales colours for sills. The other representations of the colours of the c Polar colours for silk. The other ranges, too, of Messrs. Geigy's products are stated to be of the same uniformly good quality

Consolidated Mill Supplies, Sir Phirozshah Mehta Road, Bombay

This firm was founded in November 1937 by Mr G A. Kulkarni as a proprietary concern and was subsequently registered

as a private limited company.

Mr. G. A Kulkarni, the founder of the concern, made a humble beginning early in 1918 in partnership, which continued for nearly 20 years. Thereafter, he started, under the present name and style, an independent business which has, within a short period of three years, grown considerably in volume and reputation and occupies to-day an important place in textile mill stores trade

The concern enjoys trade relations with foreign manufacturers and represents several well-established makers, prominent

- among whom are —

 1. The Nippon Bobbin Co. Ltd.,

 2. Kanai Traveller Manufacturing Co.,

 3. Umeda Seikosho, Ltd.,

Toyo Fibre Co.

The Chicago Belting Company,

6. The Chicago Beiting Company,
6. Nippon Kogyo Co.
The greater part of its activities has been confined to important lines of mill stores such as bobbins, ring travellers, spinning rings, spindles, fluted rollers, card cans, leather belting, wire healds, droppers, reeds, etc. It has earned for itself and its principals a good reputation with the active support and goodwill of its numerous

support and goodwin of its numerous customers spread all over India.

The concern has two branches, one at Ahmedabad and the other at Coimbatore, both being important textile mill centres Last year it secured the all-India representation of the Chicago Belting Co., the reputed firm of leather belting manufacturers in America, and this new department is in the sole charge of Mr B. P. Dave, formerly of the Peninsular Trading Co., Ltd., who possesses a wide knowledge of the belting trade trade

This year it has secured the representation of Messrs. Mitsui Bussan Kaisha Ltd. for several lines of mill stores for South India, including the Madras Presidency.

Corn Products Co. (India), Ltd., Bombay

Starting organized business on a modest scale in India in 1923 when its total sales of the different products including starches, dextrines, glucose both solid and liquid, gums, etc., amounted to less than 200 tons a year, the Corn Products Co. (India) Ltd., has, in the course of the last 17 years, developed into an important supply organization offering excellent service to various industries, particularly toythe. nization offering excellent service to various industries, particularly textile, all over the country, and with its activities now covering, in addition, the whole of Burma, Ceylon, Aden, Persian Gulf, Iran, Iraq, Malaya and Thailand, its turnover to-day is said to be about 20,000 tons per year.

Over and above supplying a wide variety of processing and manufacturing requisites to cotton, jute, silk and paper mills, foundries, pharmaceutical manufacturers, bakers, confectioners and numerous other types of industries, the Company also deals

types of industries, the Company also deals in an important range of food and medicinal products. And this side of the Company's business has now been harnessed to the war effort for the supply of certain vital foodstuffs to His Majesty's forces in the

This progress and development has to a This progress and development has to a very large extent been due to the efforts of Mr. E. J. Guetta, the Managing Director and Chairman of the Company, and to the traditional backing and support given by the parent organization, the Corn Products Refining Company, the main offices of which are at 17, Battery Place, New York, U.S.A., with factories and affiliates in practically every part of the civilized world

The Company's head office is at Currimbhoy House, Waudby Road, Fort (P.O. B. 994), Bombay, and branch at Himalaya House, 2nd Floor, 15 Central Avenue (P. O. B. 2191), Calcutta.

Creena Manufacturing Company, Shankar Seth Road, Bombay

The Creena Manufacturing Company was started half a dozen years ago, but the lines it essayed at first included others besides sizing materials, although at present it specializes mainly in them. It began with two or three modified starches, and experiments in the activation of Indian gums for use as size-binding agents enabled it to put on the market Gum Creena which is claimed to give a transparent, colourless solution with high adhesive power when boiled with 50 times its weight of water Boiled with starches used in sizing, it modifies them and increases their binding properties.

Fixotex Al and A2 are modified starches suited to the finishing of close textures on account of their penetrative power. The former gives a transparent film and a soft finish and the latter a somewhat translucent film and a stiff finish. Both have a marked effect, it is said, in heightening the feel and finish of fabrics and thus enhancing their market value. A highly concentrated modified starch produced by the Company is Texize. It yields concentrated solutions and forms a powerful adhesive, they say, for binding weighting materials like chinaclay on one side of the cloth in back-filling. Softex and Silverine are two other additions to their line. The former is a combination of a softener with binding properties and is used for the sizing of yarn and the finishing of fabrics. The latter serves a like purpose for art silk and for finishing cotton goods.

Altogether, after six years of cautiously expanding activities, the Company is now in a position to face trade competition as well as the vicissitudes of war, because of its increased reliance upon raw materials produced in this country.

Dalmias

Dalmias are among the leading industrialists of the country (Dalmia Cement and Paper Marketing Co., Ltd., 15a, Elphinstone Circle, Fort, Bombay) who have tapped new resources in several fields of manufacture. Till recently India has been importing large quantitates of bleaching powder, and textile mills, paper mills and various other industrial units of the country were dependent on foreign countries for their supplies of this commodity. Dalmias foresaw the possibilities of the bleaching powder industry and installed a plant at Dalmianagar, which turns out about 5 tons of bleaching powder daily. Dalmia Bleaching Powder has within a short time established itself in the market. It compares favourably with other bleaching powders so far as availability and stability of chlorine are concerned and perhaps this is one reason why it has attained considerable popularity.

Dalmia Bleaching Powder is widely used in textile mills, hosiery factories, etc., and it has been stated that it has been found suitable for bleaching the finest fabrics.

Another important industry in which Dalmias are acting as pioneers is paper industry. They are the first to manufacture filter papers which have been acknowledged to be as good as any other filter papers. For quick filtration work as well as fine precipitation, Dalmia Filter Papers are reported to have been found eminently suitable and it is possible that this Indian product will replace to a considerable extent imports in course of time.

Dalmias have also taken the lead in the manufacture of a special variety of heavy boards known as leather boards. Dalmia Leather Board is already being used for padding in saddlery, shoes, suit-cases and various other articles of leather This

strikingly new line of manufacture has proved very helpful to the leather industry of the country, which has particularly heavy demands to meet at present because of the world war.

Dalmias also manufacture heavy pasteboards and mill-boards which are extensively used for packings of various kinds. Bundling boards used in textile mills are their speciality.

Dalmia cement, manufactured at five large factories, is known in Southern Asia for its fine quality In as much as Dalmias and a hitherto rival group of factories are now working in co-operation, the industry can confidently look forward to a bright future

David Bentley Ltd., Salford, England

Messrs. David Bentley Ltd., Calender Bowl makers, of Salford, Manchester, England, have been in business for 156 years. They were the original inventors of the bowls.

During the whole of its career, the business has been in the hands of the family for four generations.

They export bowls to all parts of the world, and have made a special study of the Indian cotton mills It is, perhaps, safe to say that many cotton mills in India are using Bentley's Bowls These bowls are famous for their uniform high value and economic service, and for competitive price are unequalled. Their Sole Agents in India are H. M. Mehta & Co., Bombay.

C. Doctor & Co., Railwaypura, Ahmedabad

This well-known firm of Ahmedabad and Bombay was established in 1915 by the late Sheth Lallubhai Gordhandas Mehta in partnership with the late Dr. Maganlal Narayandas. They began business activities with millstores, sizing ingredients being their speciality. They are one of the largest importers of English china-clay into India. The clay is the product of some of the deepest mines in England, and is perfectly white and highly plastic. Mr. Vadilal Mehta, one of the present partners, secured valuable agencies from reputed manufacturers during his two visits to England and the Continent, and, of these, mention may be made of W. A Scholten's Chemische Fabrieken, well-known Dutch manufacturers of starch whom Doctor & Co. represented in India from 1925 upto the outbreak of the present war Doctor & Co are the representatives in India also of the Missouri Belting Co. which has lately invented a new process of cementing and dressing leather—its special processed beltings are a speciality; of Horsfall and Bickham Ltd. of England who manufacture all kinds of card clothing and the Diamond Chain Manufacturing Co. whose chains are believed to be lasting, precise and excellent in workmanship. The last mentioned company manufactures roller chains as well as conveyor chains and sprockets and chains for special purposes.

About 10 years ago, C. Doctor & Co. opened a Machinery Department for handling the specialities of well-known Continental makers for complete textile plant, particularly spinning machinery, looms and weaving machinery for cotton, wool and jute, high speed winding and warping machines and bleaching and finishing machinery. They also installed dyeing plants for automatic dyeing in hanks, cheeses and beams in several mills in this country. These lines have become idle owing to war, the makers being enemy firms. It is, however, interesting to note that Japanese machinery business, especially dyeing, bleaching and finishing machinery has been developed by them very recently.

Another line which C Doctor & Co. have made popular is air-conditioning, which is a unit system of humidification developed by the Bahnson Co. of the U.S.A and specially adaptable for tropical requirements by individual and collective control methods. The firm, we are told, has installed over 2,000 Bahnson Humidifiers in 68 installations in the chief textile centres. The manufacturers' latest research is the "HD-2" type Humidifier, which can be installed either

in the gutter or overground. This unit gives high standards of production and it is increasingly being installed in Indian mills.

Special mention may be made of the Calico Engraving Works recently established by C. Doctor & Co in Bombay for they are believed to be the first to undertake the work on a commercial scale. Its capacity is steadily growing and the promoters aim at making India self-sufficient in this branch of the textile industry, thereby effecting a large saving for the country.

The present partners of C. Doctor & Co. are also the managing agents of Rohit Mills, Ltd., Ahmedabad, and Bipin Silk Mills Co.. Ltd., Bombay.

They have a branch office in **Bruce Street**, **Fort**, **Bombay**, where all orders and inquiries are promptly attended to.

Duncan Stratton & Co., Ltd. Bank Street, Fort, Bombay

The origin of this firm goes back to the year 1879, when its chief business was in the supply of machinery for the cotton and seed industries. Mr. Shallis, the founder, evolved, in co-operation with Messrs. Nasmyth Wilson & Co, Ltd, of Manchester, the types of Indian presses which have been supplied in India ever since. The firm has always held an agency for Messrs. Henry Simon Ltd. of Manchester, and has been responsible for the installation of the great majority of flour mills now operating throughout India In recent years all the major installations of sewage purification have been carried out by this firm. Recently, it has also been responsible for the inception of the vegetable ghee industry and the manufacture of oil engines, lathes, looms, dobbies, etc., in India.

Empress Iron and Brass Works, Connaught Road, Parel, Bombay

Established in 1889, this firm specializes in repairing work and in the manufacture of entire machines and all spare parts. They undertake to turn out machinery requisites for cotton mills, ginning and pressing factories; castings either of brass or iron and of all sizes upto 3 tons in weight, can be made in their foundry. They specialize in structural work and have in a very creditable manner erected several handsome structures in Bombay. They carry out repairs to machinery in cotton mills in Bombay and the mofussil and furnish spare parts whenever required, while, as contractors they supply building and other materials to various railways, public bodies, municipalities and the Indian Stores Department.

They are manufacturers and suppliers also of W I. gates, ornamental balcony and starcase railings, grills, collapsible and fireproof doors, water and night soil tanks, chimneys, road rollers, spiral starcases, tested weights and electrical welding work, etc.

Engineer Bros., Bombay

The Textile Wood and Engineering Works of which Engineer Bros., 16, Apollo Street, Fort, Bombay, have been the proprietors since its inception in 1918, are manufacturers of wooden articles pertaining to the textile industry

The works, although founded on a small scale, expanded steadily under Mr. R T. Engineer's management and is now managed ably by Mr J R. Engineer who has both practical and theoretical knowledge of textile machinery, it is, therefore, in a position to supply quality articles which are believed to be as good as any in the market.

Mr. R T. Engineer who was recently on a tour in Japan, specialized, amongst other lines, in the manufacture of jute bobbins and it is only due to his pioneering work that their manufacture of jute bobbins, begun shortly after the declaration of war, was able to reach a high degree of excellence. It is well that in these trying times, the Textile Wood and Engineering Works should be able to entertain large orders and

contracts for these bobbins. The works cater to other requirements also of the jute and textile mills.

The works also manufacture jiggers for cotton as well as silk mills and dyeing vats for textile or allied industries. In fact, the manufacturers claim to be in a position to supply all wooden materials, brushes, springs, and metal stampings and machinery parts.

Garlick & Co., Jacob Circle, Bombay

The firm of Messrs Garlick & Co. was established in the year 1878 and has since its inception been carrying on pioneering work in the engineering field. It specializes in structural engineering and industrial appliances suitable for textile industry such as kiers, cranes, tanks, etc., and has given highly satisfactory service to many of the leading mills of the Bombay Presidency In keeping with its policy of modernization, the Company last year sent its Structural Engineer to England for further studies in welding and, therefore, now in most of its designs welding is being incorporated

All types of casting work such as cast iron, brass, gun-metal, aluminium, etc., are also undertaken by them

undertaken by them

They have added one more activity to the already numerous lines they handle, viz., air-conditioning, ventilation and draught system and commercial refrigeration. For this class of work they represent the Westinghouse Electric Company of New York. This department is in charge of an engineer trained in the Westinghouse Factory in New York, and, therefore, a complete service for maintenance is being assured.

The installation of air-conditioning machinery of the Tata Memorial Hospital has been carried out by them.

The Company's Stores Department hold several important agencies of interest to the textile industry, the most prominent being Messrs. Alley and MacLellan's, manufacturers of "Sentinel" steam fittings, valves and steam traps.

P. & C. Garnett, Ltd., England

The business of P. & C. Garnett Ltd, was founded in 1851 by Mr Peter Garnett, a member of the well-known paper-making family of Otley, Yorkshire, to manufacture the saw-tooth wire or metallic strip, which now bears his name in the textile countries of the world. The first uses of Garnett wire were to clothe small opening and carding machines for opening the wastes made in spinning and weaving, which had previously been useless to the trade and also to clothe the licker-in rollers of cotton carding machines.

The next great step forwards came in 1878, when Mr. J. H. Leather, who then managed the business, invented a system of clothing rollers with double rows of wire (now known as A and B wire) which, by making finer clothing possible, greatly increased the potentialties of the Garnett machine. In 1902 Mr C. W. I. Leather, the eldest son of Mr. J. H. Leather, became Managing Director of the Company and at once began an active policy of developing and increasing the business, both by finding new foreign markets for the Garnett machine proper, and by building various new types of machines, that could be used by the woollen and worsted industries.

The Company made steady progress up to 1914, and during the war of 1914–18 was engaged mainly on munition work of various kinds. From 1919 to the time of Mr. Leather's death in September 1939 the firm continued its enterprising policy of finding new uses for Garnett wire and for the Garnett machine, both as an opener and as a true carding machine. In 1929 the Company took out a patent for a High Production Twin Doffer Garnett machine, a machine that is said to have revolutionized the making of cheap waddings from cotton and cotton wastes.

With the outbreak of the present war, the Company is once again working mainly on Government contracts connected with armaments.

G.E.C. in India

The General Electric Co , Ltd , of England was one of the first electrical manufacturing firms to foresee the vast possibilities of India as a country for electrical development, and early in the present century appointed Messrs. Octavius Steel & Co , one of the leading mercantile firms in Calcutta, as their Agents in India.

Owing to the development of their trade in India, the G.E.C. in 1911 decided to form a subsidiary company, The General Electric Co. (India), Ltd, and Messrs. Octavius Steel & Co. were appointed managing agents of this new subsidiary, and continued as such until 1925, when the G.E.C. assumed sole control of the Indian subsidiary company.

A branch was opened in Madras in 1912, and preparations to open a branch in Bombay were in an advanced stage when the world war broke out in 1914, which made it advisable to adopt a cautious policy, and the opening of the Bombay branch was postponed.

At the end of the World War it was decided to push on with the opening of a branch in Bombay, but owing to difficulties in securing suitable premises, it was not until 1921 that this new branch was opened.

Ever since then a steady policy of development has been pursued, and to-day every area in India in which electrical supply has been developed on a wide scale, has also seen the establishment of a G.E.C. branch, staffed by both Europeans and Indians, and able to give expert advice in connection with the G.E.C 's many products, and in the preparation of electrical schemes and projects.

With the constant expansion in its range of electrical products, and the frequent development of new applications for electricity, the GEC has from time to time added more specialists to its staff in India, so that they are now in a position to give specialized advice and assistance on such varied aspects of electrical engineering as turbo alternators, illuminating engineering, radio and telephones, cables and transmission lines, electric signalling for both railways and traffic control, and are in a position to carry out complete electrical contracts of any magnitude, from the provision of the necessary generating equipment and apparatus of every type to the erection of the plant and apparatus, and the wiring of buildings, streets, etc., for the use of electrical energy.

Many of the G.E.C. products have an international reputation, e.g., Osram Lamps, and G.E.C. Fans, to name only two which are well known in India, and G.E.C. products are to be found giving efficient and trouble-free service in all parts of the world, in all sorts of climatic conditions, and in the hands of many different nationalities.

The GEC. have taken a prominent part in the development of industries in India, and have themselves started manufacture in this country; nearly all the Osram Lamps now sold in this country are made in India. Arrangements are also progressing for the manufacture of other G.E.C. products in India.

The G E.C. have always been among the pioneers in the discovery of new ways and means of applying electricity for the good of humanity in general, and in their huge Research Laboratories at Wembley many important improvements in the application of electricity have been discovered and developed.

The G. E. C's war effort is commensurate with the size and importance of the Company, for in addition to increasing its output of products which are essential to the Empire's war effort, over 2,500 of the G.E.C. employees are serving with the armed forces of the British Empire, and among them are several members of the staff of the G.E.C. in India.

This firm is represented in India by the General Electric Co. (India), Ltd., Kaiser-I-Hind Building, Ballard Estate, Bombay, with branches at Calcutta, Madras, Delhi, Cawnpore, Karachi and Lahore.

Godrej and Boyce Manufacturing Co., Ltd., Lalbaug, Parel, Bombay

From small beginnings, about half a century ago, in the systematization of the traditional craft of lock-making in India, has grown the biggest enterprise in the manufacture of efficiency and security equipment east of Suez Godrej and Boyce now employ some 1,300 skilled workers in their plant at Lalbaug, Bombay. The lock business, which still continues, contains 200 specialists in this intricate craft. Hand-fitting is still the rule with Godrej locks and keys, but, as with the other articles they manufacture, all the preparatory processes are mechanized as far as possible.

The process of mechanization has been advanced in the Godrej Factory further than in most Indian plants. The business of Safe manufacture, which grew logically out of lock-making, now involves the handling of thick plates of toughened steel which are shaped by giant presses, some of 8 tons capacity. Such machines as shears and punches are installed on the same mammoth scale. When it comes to the manufacture of security goods where extremely fine fitting is required, such as safe-deposit doors weighing several tons, which must give a perfect seal and be proof against every kind of attack, including explosives, enormous planing machines take the components of these doors for rapid shaping to the required tolerances.

A distinguishing feature of Godrej security and efficiency equipment is the impressive range of Patents which apply to both design and manufacture. The famous Godrej Steel Almirah has passed through several stages of adding patents until it is now complete in its six-patent form. The 6-Patent Almirah, as it is called, is entirely climate-proof There are structural patents which make for the ideal combination of lightness, strength, and rigidity, and also the fact that the almirah is burglar-proof But the crowning achievement is possibly a system of rubber packing, ingeniously worked into the flanges and sockets round the double doors of the almirah, which ensures a perfect airtight seal when the doors are closed.

Besides a full range of steel desks and chairs and other office equipment including the patent ball-bearing Filing Cabinet and the "Visadex" Card System, Godrej are specialists in designing and manufacturing efficiency equipment on the most modern lines. The textile industry in particular is served by special plan-filing cabinets, storage racks, bins, and containers of every specialized description as required in the different mill departments. For the house-proud—and this refers to all those who like to have a thoroughly up-to-date office as well—there is a complete range of handsome tubular furniture supplied both in chromium-plated and stove-enamelled styles. For those who are constructing new buildings or installing strong-rooms in old ones, the Godrej patent vault reinforcement offers impregnable security. Safe-Deposit installations in particular are catered for by nests of lockers built up on an economical and extra-secure patent principle.

The requirements of the small man are catered for just as efficiently as the large industrial consumer. Cash Boxes, Wall Safes, Fire-Resisting Cabinets, and unit steel storage systems, based on bolt-up shelves and cupboards, are all typical goods made and sold by Godrej.

One of the specialized lines produced by Godrej is Hospital Furniture, and another, developed since the outbreak of war, is Field Equipment of all kinds for the Forces.

Graduate Picker Works, Ahmedabad

When the Great War broke out in 1914, the late Mr. G. R. Mansuri of Ahmedabad lost heavily in cotton business. He happened to be a friend of the late Seth Mangaldas Girdhardas, prominent millowner of Ahmedabad, who suggested to him to start picker making in India and promised to give him the utmost help and co-operation. This was the origin of the first picker made in India and used in the mills of Seth Mangaldas. The work was begun with hardly two or three men who were increased later to

perhaps seven or eight or ten, at the most, as the whole group of Seth Mangaldas Mills began using the firm's pickers

The late Mr. Mahomed G Mansuri, B A, the son of the founder, saw that the prospects of this business were bright. Being by nature independent, he preferred to develop this business rather than plod in some dusty corner of the Secretariat, where he had been working for some time. Day and night he laboured to develop the line. The factory began to turn out more pickers than were required by the mills of Seth Mangaldas Girdhardas and so new markets had to be found. Although pickers made by them in the beginning were no better than mere lumps of leather the attempts of Mr. M. G. Mansuri to improve quality bore fruit. Besides, in 1925-26 the Director of Industries, Bombay, took an interest in this manufacture and sent pickers to the leather Research Institute, Calcutta, for expert opinion and advice. This improved the quality of the pickers very considerably, and made them known throughout India. The production had to be increased to keep pace with the increasing demand.

All the strain of developing this new line and putting it on a sound basis at last told upon the health of Mr. M. G. Mansuri who died in 1935, leaving the fully developed factory to Mr. I. M. Mansuri, B A., his only son.

The manufacturers have received the support and co-operation of leading industrialists who have not merely purchased these pickers but gone farther and suggested improvements which were carried out readily.

At present this firm manufactures different types of pickers and buffers used in cotton, jute, woollen and silk mills. Standard qualities are always available and they can prepare special quality or special type pickers promptly to order.

The Graduate Picker Works have been awarded two gold medals and numerous certificates of merit from the actual users.

Greaves Cotton & Co., Ltd., Forbes Street, Bombay

The firm of Greaves Cotton and Company was founded in 1870 by James Greaves taking into partnership George Cotton (subsequently Sir George Cotton). Prior to that date, James Greaves traded for some years in Broach under the name of James Greaves & Co. The Manchester Branch of the Company trades under this name to-day. James Greaves came to India in 1859, just prior to the American Civil War. His father had been a successful cotton millowner in Lancashire for many years, but the outbreak of the American Civil War cut off supplies of cotton, and James Greaves, who had come out as Manager of the Landon Mills at Broach (the first cotton spinning mill to be built in India) set up in business as James Greaves & Co. with the idea of purchasing Indian cotton to send to Lancashire to replace the cotton that could no longer be obtained from America. In those days the railway had not been built up to Broach and all the trade was carried on by means of country craft, Broach being a flourishing port. Prior to James Greaves taking him into partnership, George Cotton had also traded in Broach, selling cotton for The East India Cotton Agency.

James Greaves was very active in connection with the Broach Exhibition of 1868. He had, whilst on leave, visited the Paris Exhibition, and on his return to India decided to promote something similar in Broach The exhibition was a tremendous success It was opened by the then Governor of Bombay, Sir Seymour Fitzgerald, on the 24th December 1868 in the presence of the Gaekwar of Baroda and many princes, Nawabs and nobles from various parts of the country. A grand durbar was held by the Governor the next day. A large number of American merchants also attended the exhibition. The exhibition had the distinction of being the third exhibition of its kind in the world, and the first ever held not only in India but in all Asia.

Greaves Cotton and Company at the outset carried on a cotton export business and ran a number of ginning and pressing factories. Subsequently, in 1870, they opened an office in Bombay and soon after floated the

Empress Mills (subsequently known as the Old Empress Mills) The business prospered and in successive years the firm started the following mills

Leopold Mills, James Greaves Mills, Howard and Bullough Mills, Connaught Mills, New Empress Mills,

Alfred Manufacturing Co, Broach, Albert Edward Mill, Broach

Later on the agencies for the Imperial and Apollo Mills were secured by them

Greaves Cotton & Co started a new system of remuneration for managing agents, in that their commission was not charged on turnover but on net profits.

The firm was enlarged from time to time James Greaves died in 1882 and was succeeded by George Cotton. George Cotton, who retired from Bombay in May 1900, continued his activities with the firm in Manchester until his death in 1904. He was Sheriff of Bombay on one occasion in 1897 and President of the Municipal Corporation on two occasions. It was after his second period of office as President of the Corporation that he was knighted in 1897 During the plague nots following the stringent regulations with regard to segregation, etc., which had to be put in force in the mill areas, George Cotton took a leading part in pacifying the millhands. He was assisted in this by Rao Bahadur Currumsey Damjee, the senior partner of the firm's muccadums, who was made a Rao Bahadur in connection with his services during the plague nots

On the retirement from Bombay of Sir George Cotton in 1900, he was succeeded by John Greaves, the eldest son of James Greaves. John Greaves was a member of the Bombay Municipal Corporation and also at one time the Chairman of the Broach Municipality. He died in 1904, and was succeeded by Herbert Greaves, the second son of James Greaves. Herbert Greaves was born in 1861 in Broach in the bungalow in the Landon Mills compound. He came out to India again in about 1830 and shortly after was President of the Broach Municipality. In 1885 he was transferred to James Greaves and Co., Manchester, but he returned to India again in 1900. He was Sheriff of Bombay in 1911 during the Governorship of Sir George Clark, and during his time was President of the Millowners' Association, a member of the Municipal Corporation, and of the Governor's Council prior to the Montagu-Chelmsford Reforms. He was always deeply interested in Broach—in particular he maintained his interest in the Broach Sanitary Association and the Library. Mr. Herbert Greaves died in 1921 leaving Mr. Neville Greaves Hunt as surviving partner Mr Hunt retired in 1929. Mr J. B Greaves who came out in the year of his father's death is the present head of the firm. Colonel Arthur Leslie joined the firm as one of its partners in 1889. He retired in 1908 and died in 1931. During his time he founded the Society of Honorary Presidency Magistrates in Bombay and was the first President. Incidentally, Mr. J. B Greaves, the present head of the firm, was President of the Society for 1939.

In 1922 Greaves Cotton & Co. was turned into a limited company. Amongst the first directors of Greaves Cotton & Co., Ltd., were Messrs. John Brownson Greaves, Neville Greaves Hunt, Alexander McIntosh, Bomanji Hormusjee Bharucha, and Harold Gwyn Davies, all of whom remain directors of the Company to-day. Mr. Bomanji Hormusjee Bharucha joined the Company in 1883 and is, of course, to-day by far the most senior member of the staff Mr. Alexander McIntosh was President of the Chamber of Commerce in 1938, and Mr J. B. Greaves has been one of the representatives of the Chamber of Commerce in the Legislative Assembly for many years. Mr. A. Forrington was made a director in 1938.

The business went through very hard times during the last war, due principally to the loss of the China yarn market where the bulk of the firm's mill yarn was sold. All the mills went into liquidation in 1916, but subsequently the Howard and Bullough Mill and the Apollo Mill were bought back. The tide turned in 1918. The Apollo Mill was

sold to great advantage, to be followed shortly after by the sale of the Howard and Bullough Mill to E. D. Sassoon & Co., Ltd. This ended Greaves Cotton and Company's active management of cotton mills in Bombay, which had been a feature of the mill trade from about 1870 to 1918.

Alongside of the mill managing agency business, however, an engineering and general merchanting business had sprung up, and, by 1922 when the last of the cotton mills was disposed of, this business had attained very considerable proportions, the Company being agents, amongst others, for Messrs. Howard and Bullough, Ltd. of Accrington, Messrs. Ruston and Hornsby Ltd. of Lincoln, Messrs. Mather and Platt Ltd of Manchester, Messrs. Henry Livesey Ltd. of Blackburn, and The Sun Insurance Co of London, for over forty years.

After 1922 the Company developed more and more on engineering lines, and to-day four large separate engineering and allied sections exist.

- 1. The Electrical Section which has now been formed into a separate company styled Greaves Cotton and Crompton Parkinson Ltd., who handle throughout the Bombay Presidency, Bengal and Northern India, the whole of the products of Crompton Parkinson, Ltd., London, and many other electrical concerns.
- electrical concerns.

 2. The Textile Spinning Machinery Section, which has also been formed into a separate small company, styled Indian Textile Engineers Ltd., who represent Messrs. Asa Lees & Co., Ltd., Brooks & Doxey Ltd., Dobson & Barlow Ltd., Howard and Bullough Ltd., J Hetherington & Sons, Ltd., and Platt Brothers & Co., Ltd.—all of Lancashire. This concern handles the bulk of the spinning machinery that is imported into India.
- 3. The Mechanical and General Engineering Section of Greaves Cotton & Co., Ltd., handles a number of machinery agencies the most important of which is the agency of Ruston and Hornsby Ltd., the well-known Lincoln oil-engine manufacturers.
- 4 The Millstores and Weaving Section handling the mills' weaving and finishing requirements, represents, amongst others, Messrs. Henry Livesey Ltd of Blackburn and Messrs. Mather and Platt Ltd. of Manchester. In addition, this section handles the normal millstores requirements of the mills

The Company and its associated companies have 22 Europeans on their staff in India. Branch offices are situated at Manchester, Calcutta, Lahore, Madras and Ahmedabad, and there are agents of the Company in every important town throughout India.

It is of interest to note that, unlike many other commercial houses in Bombay, the head office of the Company has always been in Bombay.

E. Green & Son, Limited, Wakefield, England

The original Green's C I Vertical Smooth-Tube Economiser was invented and patented in the year 1845 by Mr. Edward Green, grandfather of Mr. Frank Green, the present Chairman of the Company, and this type of apparatus is still used extensively in all classes of industry throughout the world Improvements, of course, have been made in various details of manufacture, the most important of which is the introduction of the reinforced "ring-stay" joint between certain of the tubes and headers. This was found necessary to meet the demands for higher pressures.

The advent of the steam turbine for power station work resulted in increased demands for steam which involved larger boilers of the water-tube type. Green's C I. Tri-tube Horizontal Smooth-Tube Economiser with reinforced "ring-stay" joints was devised with the object of obtaining a maximum heat transmission with a minimum space occupied, and was superimposed above the boiler. The first tri-tube economiser was supplied in 1920

The changes brought about by economic conditions following the Great War necessitating economies in both capital outlay and space occupied, led to the investigation of a cheaper form of heating surface. After a considerable amount of experimental and

research work, Messrs E. Green and Son, Ltd, placed on the market in 1927, a c 1 horizontal Gilled Tube Economiser with circular gills which proved very successful in operation, and next year they acquired the patent rights of the "Foster" Economiser, which was first introduced in America. The fundamental principle of this type of economiser is that it consists of an inner steel tube which is easily capable of withstanding the highest pressures, having a series of c 1 gilled sleeves shrunk on the outside The original design has been considerably improved by Messrs. E Green and Son, Ltd., and this economiser has been installed at several leading power stations in different parts of the world. The latest development in the direction of "extended heating surface" economisers is the "Premier Diamond" Horizontal Gilled Tube Economiser, which was first introduced by the Company in 1938 The tubes of this type of economiser have a "diamond" shaped body with rectangular gills, which minimizes the possibility of soot deposits on any portion of the heating surface. This design also possesses the essential feature that the whole of the heating surface can be inspected quite easily, as all sides of the whole of the tubes are clearly visible along the diagonal passages.

The "Premier Diamond" Economiser is available in two types. For medium pressures the tubes are of cast iron with integral cast-iron gills, and for high pressures a steel tube construction is used with castieron gilled sleeves shrunk on the outside, on the lines of the familiar "Foster" design

E. Green and Son, Ltd, are in a position to supply economisers for all types and sizes of boilers, suitable for all pressures. The type of economiser generally adopted in the textile industry is the original vertical tube design, as this is usually found to be the most suitable for industrial plants with their fluctuating loads, and where a reserve of hot water is required in case of emergency. In addition the economiser can be utilized for providing hot water for various forms of process work.

The Green's Fuel Economiser has been extensively adopted in all branches of the textile industry in various parts of the world and is recognized by all steam users to be an indispensable auxiliary to boiler plant. The Bombay office was opened in the year 1926 and the Resident Representative is Mr. J. L. Wright, 6, Rampart Row, Fort, Bombay.

W. T. Henley's Telegraph Works Company, Limited, England

Mr. W. T. Henley was a "Telegraph Manufacturer" whose works at North Woolwich, England, were known as W. T. Henley's Telegraph Works. When the present company was formed in 1880 with Mr. Henley himself as one of the seven original directors, it was decided to use the existing description with the addition of "Company Limited." The Company took over a portion of Mr. Henley's old works, the remainder having been disposed of. The main demand at that time was for submarine telegraph cables, insulated with gutta-percha, and many important pioneer works were entrusted to Henley's. In 1882 Mr. Henley died, passing on to other hands the industrial structure which single-handed he had built up. In 1937 the Company celebrated its centenary in a suitable manner. The manufacture of electric wires and cables for non-submarine purposes increased apace during the closing years of the nineteenth century, chiefly as a result of the development of electric lighting, since the invention by Swan of the incandescent electric lamp in 1878. Heavier power cables were required and for these new forms of insulation were developed. Manufacturing and research developments kept products include electric cables and wires of all types with insulations of cotton, silk, enamel, rubber, bitumen, paper, varnished cambric, etc. Rubber as an insulator is still used almost exclusively for cables for house wiring and similar purposes, and Henleys

claim to be one of the largest manufacturers of such wires

As to research in the cable industry, Henley's laboratories at Gravesend, England, comprise various departments, experimental workshops and administrative offices exceeding 14,000 square feet in area. Their high-tension laboratory is equipped with the most modern testing plant for the measurement of dielectric losses and for applying high-voltage tests to finished lengths of cable upto the highest voltages which modern progress demands. Considerable annual expense is entailed in the upkeep of the extensive laboratories but valuable results have been achieved.

valuable results have been achieved. With the general public the name of "Henley" is perhaps best known throughout India owing to the introduction of the Henley Wiring System in the year 1911. This, we are told, was the first surface system of electric wiring of its kind, and it is still probably safe to say that more installations have been carried out by means of the Henley Wiring System than any other system of surface electric wiring. In addition to the manufacture and supply of electric wires and cables of every description, Messrs W. T. Henley's Telegraph Works Co., Ltd., also maintain in this country a contract department and undertake the complete erection and installation of cables, overhead transmission lines, etc., and complete electrification schemes for cities, cantonments and mills, docks, railways, etc

Henleys were one of the first of the cablemaking firms to extend their organization to India and the valuable experience thus gained over many years is incorporated in their products.

This organization is now under the control of Mr H. G. Sale, A.M I E.E., Manager for India, with the head office at Henley House, Old Court House Corner, Calcutta, and relative branch offices at Ballard Estate, Bombay; McLeod Road, Karachi; The Mall, Lahore; and Chandni Chowk, Delhi. Their Agents for the Madras Presidency are the Crompton Engineering Co. (Madras) Ltd., 2nd Line Beach, Madras.

Hindusthan Co-operative Insurance Society, Limited (Head Office, Calcutta)

The report and accounts of the Hindusthan Co-operative Insurance Society, Ltd., for the period of eight months (from 1-5-1939 to 31-12-1939), reflect credit on the management of this progressive Indian life office. "Hindusthan Co-operative" has been able to keep its head above water in new business despite the prevailing gloom of the war crisis, and the steady new business maintained by the Society year after year is an index of the popularity it enjoys.

The new business during these eight months was Rs. 2,10,27,007 which on yearly basis would be Rs. 3,15,40,515 as against Rs. 3,14,26,900 of the year previous, and the total premium mome in respect of life and provident endowment insurance business amounted to Rs. 46,65,656. Claims by death in this eight-month period took Rs. 6,29,932 and claims by maturity took Rs. 6,27,562, while the sum paid on surrenders amounted to Rs. 2,00,004.

The further growth of the Society's funds is marked out by the figures which indicate that the life fund has risen from Rs. 2 96 crores to over Rs. 3.09 crores.

The management and administration of the Society is in the able hands of Mr. N. Datta—the Secretary and Chief Officer of the Society. The Bombay Branch of the Society is in charge of Mr. S. C. Majumdar, who is a very popular figure in the commercial and industrial circles of Bombay.

Indo-British Trading Bureau, Elphinstone Circle, Bombay

Established in 1917, this firm imports from England and the Continent selected materials required in the process of weaving such as shuttles, pickers, picking bands, buffers, steel reeds, wire healds, cotton healds, elastic healds, oil cans, etc., and always maintains large stocks of these articles.

During the last several years, it has been recognized and patronized by many textile mills and weaving factories and it has been able to rise to the present position by virtue of its quality goods, business integrity and prompt and careful service

This firm caters to the needs of the poor handloom weavers of this country, and has always been on the lists of the Provincial Governments in India, Burma and Ceylon.

Indo-Textile Stores, Apollo Street, Fort, Bombay

The company is a partnership consisting of Mr. S I. Vakil, an Advocate, and Mr. P. T Jani They have been fortunate to obtain the reputed agencies of "Atlas" brand steel reeds, and "Pineapple" brand shuttles and pickers. These are quality articles used for over 30 years by many Indian mills with satisfactory results They always maintain large stocks of reeds and pickers in all sizes.

Their cotton muxing oil—"Sprayon" oil—is used by mills, especially those manufacturing coarser count cloth. It is said to stop breakages of yarn, strengthen it and add weight and shine to it. Apart from these specialities they are directly importing picking bands, roller skins, buffers, Oldham's cotton bandings, Sperm Oil, etc

S. K. Kabbur Ltd., Bombay

Founded by Mr. K H. Kabbur, this firm is now well known. Mr. Kabbur established a colour business in Manchester in 1915 under the name of Messrs. K. H. Kabbur & Co. and, with business expansion, 14 branches in different parts of the world were soon opened. In 1922 the firm was registered in Manchester under the name "Messrs. Kabbur & Co., Ltd.," and soon after, it established its branch in Bombay also.

Early in 1939 a new concern under the name "S. K Kabbur Ltd." was registered in Bombay It gives expert advice on all branches of textile manufactures and sends demonstrators to any part of India to explain the intricacies of colouring and its application. It is the Sole Agent for several colour manufacturers in England, Japan, and U.S.A and has connections all over the world.

Mather and Platt, Ltd., Manchester, England

At the beginning of the nineteenth century, when Lancashire was in the first stages of the great metamorphosis into industry, a Scotch engineer, Mather by name, came to Salford and set the foundations of the great firm that to-day bears his name. When his sons, William and Colin, came into partnership at the Salford Ironworks in 1835 they found there the solid foundations of a prosperous business in machinery for the later stages of textile manufacture. William Mather had a son, also William, who joined the firm in 1850. In 1858 William Mather (Sr) died, and Colin Mather appointed young William to be the Assistant Works Manager. Five years later, William Mather (Jr) was taken into partnership, but shortly afterwards his senior colleagues retired, leaving him in sole command. Then John Platt, the son of W. W. Platt, joined him in partnership, and William Penn and Colin, the sons of the elder Colin Mather also came into the firm. Mather and Platt now employed 300 men.

It was in the seventies that Mather and Platt added the steam engine to their textile machinery and other manufactures, patenting a piston for large marine engines, with immediate success.

But principally the inauguration of the then revolutionary scheme of technical education for the employees singled the firm out for distinction. In 1873 William Mather started the Salford Ironworks Evening Science School in a small room in the office building. The classes grew, in Queen Street, Salford, the William Mather Institute was opened for the firm's employees and others but, in 1905, it was closed down as the progress of technical education under the local authorities had made it redundant.

In 1882 an electrical department was opened, in 1002 an electrical department was opened, and one year after its inception it made history by purchasing the manufacturing rights of Edison's dynamo, shortly afterwards to be greatly improved by Dr. John Wildelmann Hopkinson

The first electric underground "tube" railway—The City and South London—was completely equipped with electrical plant, including the generating plant and locomo-

Pumps were added to the list of productions and a great step was taken when, in colla-boration with Professor Osborne Reynolds, Mather and Platt introduced and manufactured the first high-lift turbine pump, the ments of which earned for it a place in the Science Museum at South Kensington. The manufacture of centrifugal pumps for all industries is at the present day one of the firm's strongest specialities.

In 1884 Grinnell Automatic Sprinklers, manufactured by Mather and Platt, recorded their first success in England. By their action a cotton mill was saved from destruc-tion by fire and that was the first of a remarkable record of saves. Until then, fire had cost industry very dear, and the textile mills m particular had suffered heavy losses; msurance rates were a great burden and the demand for an adequate fire protection was one of pressing urgency. That the problem should have been solved so completely was in keeping with the reputation pletely was in keeping with the reputation that Mather and Platt were building. Another landmark was added in the year 1893. William Mather decided that a working week of 53 hours did not allow his employees week of 30 nours and not allow his employees enough leisure. By agreement between trade unions and his Company, he instituted a 48-hour week, believing that the reduced working hours would benefit both the men and the firm. His contention proved correct and, after twelve months' trial, the 40-hour week was made a permanent institution, at that time the only move of its kind amongst engineering firms in Great Britain.

Inevitably, the quarters at Salford became madequate, and accordingly, in 1900, 45 acres of land were bought at Newton Heath. The removal from Salford, however, to the new site at Newton Heath was gradual. Not until 1912 were the chief departments established there, and not until 1938 were the Salford Ironworks completely closed.

In 1916, at the age of 78, Sir William Mather, as he had then become, retired from active business life, his surviving son, Mr Loris E Mather, succeeding him as chairman of the Company, a position he still retains Under the present chairman the Company's progress is maintained Of late years great progress has been made in automatic sprinklers, a method of extinguishing fires involving inflammable liquids by the use of water has been discovered and patented in the "Mulsifyre" system.

The welfare of the worker is as well guarded now as ever it was. There are day continuation classes for apprentices, physical training classes, and classes to give clerical instruction. New canteens, excellently equipped, are run by works committees, pension schemes, holiday-clubs, and pension schemes, holiday-clubs, and savings-clubs are instituted and encouraged. Throughout the lustory of the firm Mather and Platt Ltd. have specialized in the development of finishing machinery for the textile trade. They have been responsible for a great deal of pioneer work and for equipping many textile finishing mills in India and other parts of the world.

Mayashanker, Thacker & Co., Apollo Street, Fort, Bombay

Started in the year 1908, this firm specia-

lizes in weaving lines only.

They have been holding the Sole Agency in India of the well-known dobby manufacin India of the well-known dobby manufacturers, Messrs. Lupton and Place, Ltd., Burnley, for their "Climax" Dobbies since they first started in business. They are also distributors to the well-known firm of Messrs John T. Hardaker, Ltd., Bradford, Jacquard Manufacturers and Harness Builders. Mr. Mayashanker Mulshanker Bhatta, the Sole Proprietor, is a director on the Brand of their Indian commany. the Board of their Indian company.

Mr. Mayashanker floated in 1938 a small proprietary spinning concern known as the Shree Digvijayasinghji Spinning and Weaving Mills at Jamnagar.

. M. Mehta & Co., Manekji Wadia Building, Esplanade Road, Bombay

The firm of Messrs. H. M Mehta & Co was started by Sir Homi Mehta in 1897 and it restricted its operations at first to the importation and supply of cotton mill stores. A company was formed for this purpose in 1897 under the name and style of The Mill Stores Trading Co. of India, Ltd., with a capital of Rs. 50,000 of which only Rs. 15,000 were called up that a recovery fund of were called up, but a reserve fund of Rs. 1,00,000 was made up in five years from the profits in the midst of keen competition, and the paid-up capital was increased to Rs. 1,00,000. The firm then extended its business operations and took up agencies for the Victoria Mills Ltd., the Jubilee Mills Ltd, the Raja Goculdas Mills Ltd, and other industrial and insurance concerns. The business of machinery agents was added in 1907, the name of Messrs. H. M. Mehta & Co. being closely associated with the expansion of the Indian business of Messrs. Dobson and Barlow Ltd., Kay & Wilkinson Ltd., Hacking & Co., Ltd., Wilson & Co. (Barnsley) Ltd., J. H. Riley & Co., Ltd., and other well-known Lancashire and New York other Well-known Lancashire and New York manufacturers of textile machinery and accessories, such as Wilson and Longbottom Ltd., J. H. Riley & Co., Ltd., Goodbrand & Co., Ltd., Chas A. Schieren, Thomas and J. Walton, James Taylor & Sons, J. Hodgkinson and Sons, etc

In addition to the above import business of mill stores and machinery, Messrs H M. Mehta & Co. have various other lines of activities.

H. M Mehta & Co. are one of the largest and best known cotton merchants in Bombay dealing in Indian as well as all kinds of foreign cottons. Sir Homi Mehta, the founder of the firm, floated the Nasik-Deolali Electric of the firm, floated the Nasik-Deolah Electric Supply Co Ltd., the Nadiad Electric Supply Co., Ltd., and the Navsari Electric Supply Co., Ltd. In addition to the above electrical concerns, Sir Homi Mehta founded the Gaekwar Mills Ltd., and the Navsari Cotton and Silk Mills Ltd. in the Baroda State, his latest successful venture being the Dhrangadra Chemical Works Ltd., Dhrangadra.

Mitsui Bussan Kaisha Limited (Mitsui & Co., Ltd.)

Unlike other business houses of the world, Mitsus devoted their energies first to the increase of Japan's productive power. They established cotton spinning mills and undertook their management and imported Indian cotton in such large quantities that Mitsui Bussan Kaisha, Ltd. opened an office in Bombay in 1893, and the shipping line and the Consulate soon followed.

They also owned silk mills in Japan, and made tireless efforts to promote sericulture Japan is now the principal producer of raw silk.

At the end of the Russo-Japanese War in 1905 they occupied a prominent position and every subsequent decade has seen new branches established the world over and new lines of trade added.

The Board of Directors of the Company in the head office at Tokyo directs and supervises its affairs. Branch offices have been opened at important centres of the world while representatives or agents are posted at less important centres. Groups of important lines of merchandise and services have their respective controlling headquarters at Tokyo.

The business of the Company covers raw silk and silk goods, coal and oil, machinery, metals and metal goods, cereals and fertilizers, sugar, lumber, general merchandise, shipping, shipbuilding, insurance agency and wharves.

The capital of the Company was first fixed at 200,000 yen in 1878, but to meet the expansion of the business, it was raised to 1,000,000 yen in 1893 and to 20,000,000 yen in 1909 and once again to 100,000,000 yen in 1918. To-day the figure stands at 300,449,500

The Machinery Department is engaged in the sale and distribution of machinery and tools made by the most modern Japanese workshops. The department represents makers whose names are known all over the world and its business includes a wide range of and its business includes a wide range of textile machinery, electrical machinery, rotary and other printing presses, sugar mill machinery, locomotives, railway equipment, aircraft, radio apparatus, etc. As the Agents of Toyoda Jido Shokki Seisakusho, Ltd., and Shibaura Engineering Works, foremost establishments of their kind in Japan, the department sells everything connected with cotton mills and with the connected with cotton mills and with the generation and utilization of electric power from the largest turbo-generators to the smallest household appliances

Mysore Iron and Steel Works, Bhadravati

The works are situated at Bhadravati on the Birur-Shimoga section of the Mysore State Railway The main plant comprises a modern charcoal blast furnace of 80 tons daily output, a wood distillation plant with 16 large oven retorts for carbonizing 250 tons of wood per day, and a by-product recovery chemical plant to treat 30,000 gallons of wood distillate daily.

The other sections consist of a pipe foundry with two turn-tables with a daily turnover of 40 tons of C.I. pipes, a general foundry, a tar distillation plant, a boiler house, a power house, an up-to-date pattern and machine shop, and a steel plant for the manufacture of mild steel sections and a plant for manufacturing Portland coment. facturing Portland cement.

A gravitational ropeway down the Kemmangundi range, about 25 miles from the works, and a network of tramways extending to the neighbouring forest areas serve to bring in the ore, limestone and fuel required for operation.

The rolling mill consists of two 19-in. stands provided with cross repeaters and driven by a flexible motor coupling. An up-to-date mechanical cooling bed is provided with a rotary shear. The rolling mill also consists of a hoop and strip mill.

Cement — The cement plant has a capacity of 60 tons per day and is of the modern type with a well-equipped laboratory attached to it. The essential raw materials are limestone, clay and blast-furnace slag, the last being a waste product from the blast furnace. The standard "wet process" of manufacture is adopted.

The materials are tested at all stages so as to ensure finished cement conforming to British standard specifications and equal in all respects to the cement usually marketed ın India.

Among the products manufactured are charcoal pig-iron, C I pipes and specials, ornamental and structural castings, engineerornamental and structural castings, engineering and industrial castings, general utility castings, grey acetate of lime, C.P. Methanol, methyl acetone, denaturing grade methanol, water white methanol, (stove spirit) refined wood tar, wood tar pitch, "Kreso" (disinfectant), black paint, wood preservatives and cement; rolled mild steel bars (flat, square and round), angles reinforcing hars boops and strips angles, reinforcing bars, hoops and strips,

Mysore Lamp Works Ltd., Old Tumkur Road, Yesvanthapur, Bangalore.

The Mysore Lamp Works Ltd. is one of The Mysore Lamp Works Ltd. is one of India's well equipped electric lamp factories, employing specially trained labour and modern equipment. In a short time, the Mysore Lamps have become known for high burning qualities—long life and efficiency. Tests by Government and other departments are reported to have proved that they are as good as several other makes and perhaps cheaper. They are made with Indian capital and labour and under Indian management. The factory is now under the control of the Government now under the control of the Government of Mysore and concrete steps have been taken to double the production to meet the increasing demand.

According to the test report of the Alipore Test House, the Mysore Lamps are stated to comply with the requirements of British standard specifications and they can, therefore, be used by public bodies, municipalities, corporations, factories and collieries for low consumption and efficient light.

H. D. Nariman Bros., Lohar Street, Bombay

It is essential that piecegoods and all materials that are supplied in flat roll form should have their trade marks and brand names clearly stamped upon them.

"Norman" Stamping Paste, evolved as a result of long experience, is made by Messis H. D. Nariman Bros., 269 Lohar Street, Bombay; it has a number of good features and is exceedingly simple to use. Trade marks, etc., can be stamped on any class of material with "Norman" Stamping Paste in one or more colours and may be used as for hand stamping or with the aid of a stamping machine. The non-spreading of stamps on piecegoods is of great importance, and "Norman" Stamping Paste is said to give excellent impressions on any class of material.

"Norman" Stamping Paste is supplied in a concentrated form and requires 5 to 6 parts of water to one part of the paste, and every drop of the ink thus prepared can be used without wastage. Besides, it is claimed that more impressions are obtained per lb. weight of "Norman" Stamping Paste than from several other makes "Norman" Stamping Paste is believed to be in general use in several textile mills in India

Nowrosjee Wadia & Sons, Neville House, Ballard Estate, Bombay

The Hon'ble Mr. Nowrosjee Nusserwanji Wadia, C.I.E, started, in 1878, as one of the oldest Machinery Agents in Bombay, and his name has always been intimately associated with the development of the machinery and engineering business of the Bombay Presidency. As Manager and Engineer of the Maneckjee Petit Mills, Bombay, he was directly responsible for their outstanding success and his authoritative opinions and expert advice were eagerly sought by the millowners of those days to whom he acted as technical adviser. In 1895 he took his three sons Cursetji, Nusserwanji and Rustomji as partners and founded the firm of Nowrosjee Wadia and Sons.

After the death of Mr. Nowrosjee Wadia, in 1899, the responsibilities of managing the firm devolved chiefly on Sir Ness, his brother Sir Cusrow having retired from the partnership in 1908. Messrs. Nowrosjee Wadia and Sons are Agents for the Bombay Dyeing and Manufacturing Co., Ltd., which includes the Textile Mill and the Spring Mill, two of the biggest and most successful cotton mills in the country.

In addition to these concerns, Messrs. Nowrosjee Wadia and Sons have designed and equipped a large number of cotton spinning and weaving mills complete with power plants, gearing and all machinery and other accessories. These concerns have worked with the highest efficiency and economy as much as the result of the excellence of the machinery supplied by Platt Bros. & Co. as of the technical knowledge and experience of the late Mr. Nowrosjee Wadia, who was the first Indian to act as consulting expert and adviser to the Bombay millowners in the early stages of the mill industry. His son, Sir Ness, has also had the advantage of practical training in a cotton mill and, in addition to his extended experience as a millowner, he has had exceptional opportunities of keeping himself in touch with improvements in textile manufacture and in mechanical and electrical engineering. These qualifications have helped materially towards the expansion of the business of Messrs. Nowrosjee Wadia and Sons as designers of textile factones and machinery suppliers. They have in the past contributed substantially to the successful sale in India of the machinery manufactured by such important British Companies as Platt Bros. & Co., Ltd., Hick Hargreaves & Co., Ltd., Wilson Bros. Bobbin Co., Ltd.,

Eadie Bros & Co., Ltd., John Brandwood and Thomas Hardman & Sons, Ltd. Among the leading British manufacturers whom they now represent in India are Eadie Bros. & Co., Ltd., Wilcock Bros., Thomas Hardman and Sons, Ltd., Spurrier Glazebrook & Co., Ltd., and Automatic Sprinkler Co., Ltd.

P. S. G. & Sons Charity Industrial Institute, Peelamedu, Coimbatore

This charitable institution not only trains students but also manufactures machinery and agricultural implements on a large scale. Among other things they make high efficiency pumps for industrial, agricultural and domestic purposes, oil machinery, workshop appliances and spare parts. So far as the textile industry is concerned, their manufactures include double roller cotton gins, reeling machines, yarn bundling presses, humidification plants, dust trunks, pneumatic delivery boxes, lever press machines, pulling-on machines, roller ending machines and exhaust blowers.

On the educational side, the Institute is recognized and aided by the Government of Madras. The courses of instruction include weaving and mechanical engineering and are so designed as to enable students to appear for examinations conducted by outside bodies like the City and Guilds of London Institute.

Situated in the vicinity of a prosperous and growing mill area, the Institute serves a very useful purpose in imparting thorough practical and theoretical training to young men. The various departments are under experienced and qualified specialists, and the workshops and laboratories are equipped on up-to-date lines. The neatness and finish of the iron and steel products made in the Institute workshops, and the high standard of work done therein have elicited well-merited praise from persons in authority like the Governor of Madras, the Commerce Member to the Government of India and the Controller of Supplies for Southern India.

Pioneer Magnesia Works, Kharaghoda

Prior to 1914 Germany supplied almost the whole of India's requirements of magnesium chloride.

On the outbreak of the World War when supplies from Germany were cut off, the late Sir Rustom Vakil and Mr. B. S. Lalkaka conceived the idea of manufacturing magnesium chloride from the "bitterns" at Kharaghoda Mr. Lalkaka was then a mill manager in Ahmedabad, and Sir Rustom a millowner. They made a very modest beginning and magnesium chloride suitable for use at the time was prepared. In 1916 a pucca factory was put up at Kharaghoda where operations still continue.

In course of time the material was improved upon. Better methods, new plant and machinery combined with intensive research began to yield their results, so that by the end of the first World War, the factory was able to supply good quality magnesium chloride.

Then came German competition and dumping in 1921. The Germans were very jealous of the growth of this Indian industry and tried very hard to throttle the local manufacture, with a view to exploiting the market after the extinction of the Indian industry. They threatened to cut prices so as to kill the industry in India, and in fact carried out their threat of cut-throat competition. Undeterred by these threats and price-cutting Mr. B. S. Lalkaka, the then managing partner, carried on his manufacture Costs were cut to the bone, economies were effected, but the unfair dumping was too much for a nascent industry with slender resources compared to the backing of millions of marks of the German combine.

The industry then appealed in 1924 and in 1927 to Government for protection, to save it from annihilation, and after two searching Tariff Board inquiries, Government granted it protection in 1931. By this time, in spite of unfair cut-throat competition from Germany,

the Pioneer Magnesia Works were supplying almost 50-60 per cent. of the requirements of the textile mills, which were the main customers and which found the Indian material equal in quality and strength to the German product. To-day 85-90 per cent. of India's needs, we learn, are catered to by the Indian industry at an economic price which is lower than the level of the first World War. New factories were erected by the Pioneer Magnesia Works, Ltd., mainly to supply export markets. Indian magnesium chloride was exported in fairly large quantities to England, Holland, Australia, Africa, Norway, Sweden, Belgium and even Hamburg, where it found a welcome market on account of its superior standard quality and packing and the high reputation of the Conipany. At present the British Empire, its Allies and neutrals, depend on the Indian industry.

Indian industry.

The Pioneer Magnesia Works, Ltd., of Kharaghoda is, perhaps, the only concern in India which manufactures heavy chemicals and sells them all over the world. The entire labour force, management and capital have been Indian from its very inception, and the Company to-day maintains more than a thousand Indians and their families. It celebrated its Silver Jubilee last year.

Richardson and Cruddas, Bombay

During the last 80 years the well-known firm of Messrs. Richardson and Cruddas, Bombay, have been noted for their structural and mechanical engineering service to India As far back as the Mutiny days Mr. Noble Carr Richardson left the Tyneside in England for India to establish what is now recognized to be one of the largest structural and mechanical engineering firms in Western India. Coming to India in those far-off days, his first act was to establish a foundry in the compound of his bungalow in Bombay and he personally initiated the locally available labour into the mysteries of the moulding "boxes" which were then ordinary packing cases! The business prospered and expanded, and within a decade it had achieved a worthy and highly deserved reputation. In 1870 he took into partnership his two sons, Noble and William, and the firm traded as Richardson and Company. Ten years later there came an opportunity of absorbing the business of Nicol and Company on the Parel Road, when Mr. John Cruddas, the manager of that company, was taken into partnership.

From that date the firm became known as Richardson and Cruddas. Mr. Cruddas, however, remained in partnership with the firm only for two years, retiring from India in 1882. As the firm grew so did the Byculla Iron Works develop and to-day they cover an area of twelve acres on the Parel Road, and about two-and-a-half acres at the branch factory at Mazagon. In the development of Bombay the firm has naturally taken an important part. The firm's quality of work is well displayed in the warehouses at the Alexandra Docks. Tata Hydro-Electric Concern's steel power house, which provides the motive power for so many of Bombay's cotton mills, with its massive 100-ton crane runway, was designed and manufactured by them. The steelwork for the Reserve Bank of India, the Metro Cinema and the new Ballard Pier Mole were also constructed by them. Behind its manifold activities, there was one great driving force in the person of the late Mr. William Richardson, who joined his father's firm in the year 1870 and retired in 1921—after over 50 years' actual association with the firm. The family tradition in the building up of the Company has been kept unbroken for the last four generations. This tradition is still maintained by the presence in the firm of Mr. William Richardson's two sons—Mr. H. L. Richardson, O B E., M.I.C.E., and Major George Carr Richardson (late R.A.), D S.O., M.C., who are maintaining to-day with their four co-partners, Mr. H. G. Pirrie, Mr. F. S. Woodcock, M.I.C.E., the worthy name established by their pioneer founder.

Richardson and Cruddas very well handle steel frame constructions for the large modern factories and buildings of to-day and are able to offer valuable service in the equipment of mills and factories. In their foundries and machine shops the firm are constantly engaged in the manufacture of cast-iron rope and belt pulleys of all sizes, mill gearings, cast-iron mill columns, cast-iron and steel tanks, and hydraulic and other piping for which they have a good reputation. They also manufacture cotton baling and finishing presses, and undertake engine and boiler repairs of all descriptions. The head office is Byculla Iron Works, Bombay, with a branch office and two workshops at First Line Beach, Madras.

Richardson, Tuer & Co., Ltd., Farnsworth, England

Nearly 80 years ago this well-known Company at Farnsworth, Nr Bolton, England, was first established under the name of Tuer Bros. & Co, to design and build specialized machinery for weaving processes in the conversion of yarn into woven fabric, and subsequently new ranges of machinery for other textile processes were continually added to its productions. Up to the last 20 years the principal products included power looms of a great variety of types, heavy and light beaming machines, dressing frames, cop and drum winding machines, besides jacquards and dobbies.

To-day, however, as for the past 15 years the Company finds itself very successfully specializing on a very wide and comprehensive range of improved dobbies, spring top motions, undermotions, heald reversing motions, scotch beaming and dressing frames with compensating tailstock for ball warps, combined scotch beaming and running-on frames, Jumbo cop winding machines for producing large tubular cops of coarse yarn on the bare spindle for inside or outside running-off; besides heavy tyre fabric looms and cotton blanket looms.

Included in their wide range of dobbies, which is their main production, are cross border models of every size and type with two or more pattern barrels each of which is independent of any other and automatically controlled by a very simple yet foolproof mechanism.

A special feature is a range of heavy duty dobbies which is also produced by the Company for webbing, awnings, matting, belting, brake linings and other extra heavy weaves.

Another speciality is a popular singleended heald reversing motion which embodies distinctive features, such as:

- (1) Adjustable spring tension to meet any requirement;
- (2) Spring tension which actually decreases when healds are being lifted and so reduces strain on the yarn
- Note —The design of this motion and the position of the springs make it impossible for broken springs to break the warp threads, which is a common weakness of other undermotions.

This improved motion represents a definite and big step forward. The savings it effects in heald maintenance and its advantage of quick and easy adjustment coupled with its gentle treatment of yarn, are factors which have contributed to its great success.

This Company has for a long number of years advertised its products in this Journal: in fact, for the past nine years its full page announcement has never failed to appear in any of its issues. The Company has unsolicitedly stated that this fact, and the 'pulling' power of this Journal, have contributed largely to the exceptional success it has enjoyed in the Indian textile

The Indian Agents of this firm are The Textile Works Ltd. (Managing Agents: Popatlal Girdharlal & Co.), Apollo Street, Fort, Bombay and Maskati Market, Ahmedabad.

SKF Ball Bearing Co., Ltd., Mustafa Building, Sir Phirozshah Mehta Road, Bombay

The SKF concern was started in 1907 for the manufacture of the self-aligning ball bearing designed by Dr. Sven Wingquist. Since that date the Company has grown from a little 12-man shop to one of the largest concerns of its kind in the world. This has been mainly due to the constant endeavour to produce only the highest quality bearings, to devise means for manufacturing these bearings at a reasonable cost, and to scientific research work undertaken concerning both the designing of the bearings, and the bearing application. With this in view, SKF use only the most modern production machines and also have acquired mines and steel works in order to control manufacture from the raw material to the finished product Six SKF laboratories supervise every phase of the manufacture of the bearings, in order, it is said, to make the SKF mark as significant on a bearing as the hall-mark is on silver.

A finished **SKF** bearing is said to pass through not less than 70 different checking operations and no trouble is spared to make **SKF** bearings a quality product in the highest sense of the word.

highest sense of the word. In addition to the self-aligning ball bearing, the range of bearings manufactured includes the self-aligning roller bearing with a greater load-carrying capacity than many other bearing types, single row ball bearing, ball thrust bearing, cylindrical roller bearing, taper roller bearing, and roller thrust bearing of international standardized dimensions, and also a wide range of special bearings Lineshafting material such as plummer blocks, couplings, pulleys, hangers, brackets, etc., are also included in the SKF manufacturing programme.

The SKF Ball Bearing Co., Ltd., Bombay, is

The **SKF** Ball Bearing Co., Ltd., Bombay, is the head office of the Indian organization of the **SKF** concern. The Company has branch offices, agents, stocksts, and representatives all over India, who maintain ample stocks of bearings available to meet the urgent demands of customers. The staff includes trained engineers who have solved many difficult bearing problems and helped Indian industries to increase production and reduce manufacturing costs. The textile industry has readily appreciated this technical service from **SKF**.

Shalebhoy Tyebjee & Sons, Bank Street, Fort, Bombay

During the course of a century, 1840-1940, the firm of Shalebhoy Tyebjee and Sons have steadily advanced to reach the important position they now hold in India. The year of their centenary finds them firmly established as one of India's foremost firms of Government, railway and shipping contractors.

Shalebhoy Tyebjee and Sons have been uniformly successful because they have consistently stuck to their original policy of public service They have always supplied engineering requisites which have been tried, tested and universally recognized to be among the best of their kind. They are the oldest established shipping contractors in Bombay, and supply materials and tools of every conceivable kind and quality to such services as the railways, the Government Departments, the Royal Indian Navy, Port Trusts, Harbour Works, Public Works Departments, Indian States, and industrial concerns. Their ever widening activities have won for them a first class reputation as Government and railway contractors, ship chandlers and general hardware merchants. And this reputation has secured for them many agencies of first rate importance, like Beldam's Patent High Grade Packings and Jointings, Davies and Metcalfe's Railway and Locomotive Fittings, Beresford's Railway Sanitary Equipment, Brunton's Wire Ropes, Norusto Metal Preservatives, Thomas Turton's Loco and Carriage Laminated Springs, Vertex High Tension Bronze Metal, Gandy's Brake Liners, Everseal Roofing Compounds and Protective Paints and National Vulcanized Fibre Co.'s Railway Fibre Fittings

A century of experience through their many agencies has given them a prominent

position in their special field. They have been one of the chief suppliers of engineering materials and tools for developing the harbours, railways, bridges, roads, ports, textile and sugar industries, and public services of this great country.

The attention of the readers is invited to their advertisement on the inside of the back cover page of this Souvenir for special packings and jointings manufactured by the original Beldam Packing and Rubber Co., Ltd., London. Beldam's Packings and Jointings, it is reported, have been proved, by practical experience in textile and sugar factories in various parts of the world, to be perfectly satisfactory for the services for which they are recommended.

Standard-Vacuum Oil Company, Church Lane, Calcutta

By a happy coincidence, 1940 marks the Golden Jubilee of the Indian Textile Journal and also of the Standard-Vacuum Oil Company, India Division. Fifty years ago the Vacuum Oil Company established a branch in India to market its high-grade lubricants. A year or so later this example was followed by the Standard Oil Company of New York, whose activities at that time were chiefly concerned with kerosene. These establishments in India were part of their respective companies' programm is of overseas expansion, which had commenced some five years earlier, and which culminated in the formation of associate companies throughout the world.

With subsequent developments and the merger of these two Companes in 1932, a complete range of petroleum products, manufactured from the best American crudes, was made available for Indian industry and transport.

Nowadays, when petroleum lubricants are essential to the proper functioning of industry and transport, it is difficult to realize that the steam engines and mechanisms of 70 years ago were lubricated with animal and vegetable oils. The machinery of to-day, embodying inventions and improvements which would still be inventors' dreams but for the introduction of dependable lubricating oils made from petroleum, owes a great debt to Mr. H. B. Everest, founder of the Vacuum Oil Company in 1866. Mr. Everest conceived the idea that a lubricant might be made from the heavier distillates of crude petroleum, his first objective being an oil suitable for steam cylinder lubrication. His efforts resulted in the production of Gargoyle Cylinder Oil 600 W, which is still marketed under that name, though greatly improved in conformity with up-to-date methods of refining. From this beginning, the Company developed petroleum oils for every lubrication need, playing its part in such industrial advances as the electric generator and motor, the electric transformer, the steam turbine, the Diesel engine, and the aeroplane. The growing popularity of the automobile in the first decade of this century caused the Company to apply to this field its vast experience in industrial lubrication. And so came Gargoyle Mobiloil, the first oil supplied in different engines.

Of its many achievements, one in which the Company takes great pride is the fact that every holder of the Blue Riband of the Atlantic, from the famous old *Mauetania* of 1910 to the *Queen Mary*, has won that coveted record on its oils.

During 50 years of operation in India, the Company has been closely connected with the Indian textile industry and its lubrication problems and welcomes the opportunity of expressing an appreciation of that connection through the medium of this article.

Tata Sons Ltd., Bruce Street, Fort, Bombay

The House of Tata was founded in the middle of the last century by Jamsetji Nusserwanji Tata, the Grand Old Man of Indian Industry. His first big venture was the Central India Spinning and Weaving Mills Planted in the middle of a hot, dry country, totally undeveloped at the time, it

roused many misgivings with regard to the soundness of the project. The mills, which have contributed so much to the prosperity of the city of Nagpur, are a monument to the confusion of his critics.

The policy of the House of Tata, then as now, was to strike out boldly for the new development of India's resources. Every Tata project has been preceded by years of thorough investigation and planning: in many cases undertakings have been turned down because they did not satisfy the exacting standards which were set up.

The vision of the founder of the House manifested itself in his more experienced years in the projecting of vast enterprises such as hydro-electric power and the manufacture of steel from some of the richest iron-lodes in the world. He was actively assisted by his sons, Sir Ratan Tata and Sir Dorabji Tata, who took over in 1904 when Jamsetji Tata died Tata Sons remained a partnership until 1917, when a limited company was formed which floated a number of industrial and other companies. Not all of these ventures prospered, but some of them were witnesses to the enterprise of the House The Tata Industrial Bank, which was later amalgamated with the Central Bank of India, and the New India Assurance Co, one of the largest ventures in the Indian insurance field, belong to the period of Tata. The years which followed were full of

The years which followed were full of vicissitudes, but all the time Tatas were not merely occupying themselves with reconstruction and consolidation of their existing enterprises but also projecting fresh ones. A notable instance of the latter was the floating of an Aviation Department which carries mails to many parts of India and has a record of efficiency which compels recognition. The latest enterprises of the House bear witness to the guiding principle which is to continue giving India those key industries and services which are required for a full industrial development. These are the Investment Corporation of India, founded in 1937, and the Tata Chemicals whose completion has been momentarily interrupted by the difficulty of securing machinery owing to the outbreak of the war.

The position of the House of Tata in India to-day may be represented schematically by a table which shows in round figures what are the financial commitments and the interest in labour controlled by Tata Sons. The various enterprises united in the House of Tata

	Rs.
Represent a capital invest- ment of over	62,00,00,000
a yearly wage/salary bill of Have during the last 20 years paid in wages, salaries,	4,00,00,000
etc	60,00,00,000
annually Realize annually from pro-	4,00,00,000
ducts marketed Have paid out in dividends since the foundation of	20,00,00,000
the first Company	38,00,00,000

M. J. Thanawala & Co., Forbes Street, Fort, Bombay

Messrs. M. J. Thanawala & Co, generally known as The M. Best Cotton Rope Manufacturing Co, 47-49, Forbes Street, Fort, Bombay, are well known in the rope industry in India. In the old days, Indian mills were solely depending upon foreign ropes for their main driving, and no attempts had been made to manufacture such ropes in India. But this deficiency was removed by the advent of Indian manufacturers in this field.

The progress made by M. J. Thanawala & Co during the last 30 years is noteworthy. They have boldly faced competition from other ropes in both quality and price and secured the confidence of millowners. The brand "M Best" has become very popular and it is believed to be a standard rope in the Indian market.

The Company is the recipient of several gold and silver medals in Industrial Exhibitions and has been highly recommended by the Mechanical Engineers Association, India.

During the last world war (1914-18) and also in the great *swadeshi* movement (1930) this firm played a useful part by supplying ropes and bandings regularly to the mills.

Thomas Korula, Bombay

The firm of Thomas Korula, Wakefield House, Ballard Estate, Bombay, was established in 1932, their main business being in rubber, chemicals and machinery

Mr. Thomas Korula belongs to a distinguished Syrian Christian family in Travancore. After qualifying as a technical chemist he visited foreign countries and has gained first-hand experience in several industries and made contacts with several foreign manufacturing concerns.

Besides its office in Ballard Estate the firm owns a factory in Bombay for the manufacture of various rubber articles such as rubber gloves, rubber rollers, endless blankets, etc They also undertake work of re-covering textile rollers, rubber lining of metal tanks, etc., thus catering to the requirements in rubber of Indian industries generally and of the Indian textile industry in particular.

Mr. Thomas Korula has his own rubber plantation and has supplied complete equipments and trained staff for the erection of several rubber factories. The spread of small-scale rubber industry in this country with great success during the last decade could be attributed, among other things, to the tenacious industry and application of the founder of this firm.

Tweedales and Smalley (1920), Ltd., Castleton, England

The works of Tweedales and Smalley (1920), Ltd., Castleton, England, noted spinning machinery makers, are 48 years old, but if they were rebuilt to-day the general layout could scarcely be improved upon. Production to-day is on the straight-line principle—i.e., there is steady progression through the works from the arrival of the raw materials to the despatch of the finished machinery.

Accuracy and time saving is symbolized by the system of electric clocks throughout the works, which are synchronized by a master clock. A factor of vital importance in all works and factories is the method of driving machinery.

driving machinery.

Until 1921 gas engines supplied the power, the gas being generated with a Mond producer gas plant; to-day the gas plant is in operation for the heat treatment furnaces and the foundry core ovens. The electric motors installed throughout the works vary from 100 h.p. down to fractional horse-power motors. The group-drive system has been adopted in most of the workshops, but in the saw mill and some other departments machines are individually driven

For the visitors to these works the electrical equipment is of absorbing interest. The laboratory, for instance, is totally electrically equipped, and the firm had the first private automatic telephone exchange in England. This exchange of 100 lines was installed in 1913. Nothing is left to chance by the firm, and stroboscopic devices are used by which fast-running parts are apparently slowed down and can be observed carefully. These devices assist the designer considerably enabling him to solve vibration and other problems.

The Bombay Office of this Company is located in the United India Life Building, Sir Phirozshah Mehta Road, Bombay.

Volkart Brothers, Graham Road, Ballard Estate, Bombay

The firm of Volkart Brothers was founded in 1851 by S. Volkart and his brother J. G. Volkart in Winterthur, Switzerland, and Bombay. It is a private partnership with unlimited liability.

Starting with the export of raw cotton and the import of manufactured goods, the ramifications of the firm grew rapidly, so that after 10 years of trading there was hardly a staple product of India which was not handled by it.

In 1864, the firm founded the Tinnevelly Press Co. Ltd., which in 1873 was amalgamated with the Bhavnagar Press Co., and the Amraoti Press Co., to form the Volkart United Press Co., Ltd., Bombay, having at its disposal five cotton presses. To-day, the firm not only owns 18 hydraulic presses but also 12 ginning factories, coffee curing works, coffee plantations, etc.

The main business, however, always remained in cotton, and as far back as 1886, a shipment of 9,416 bales of cotton left India for Ghent in Belgium. As a matter of fact, Volkart Brothers were the first firm to load sailing vessels and steamers in India to the chief ports in Europe.

The firm gradually grew and Branch Houses were opened in Colombo (1857), Cochin (1859), Karachi (1861), London (1868), Tellicherry (1876), Tuticorin (1887), Madras (1888), Shanghai (1901), Japan (1919), New York (1920) and Calcutta (1921). Agencies have been opened all over India until to-day there are over 200 working under the various Branch Houses. To-day Volkart Brothers handle a large variety of engineering lines which include textile machinery, electrical equipment for all branches of the industry, oil and diesel engines, air-conditioning and refrigerating equipment, milling and agricultural machinery. A recentaddition to the firm's activities is the importation of dyes and chemicals, mainly for the textile industry, for the distribution of which a large, well-equipped service department is maintained Volkart Brothers are also managing agents of the Swiss Engineering Co, Ltd., which handles motor car sales and to which a complete workshop and service department are attached.

Moreover, Volkart Brothers are entrusted with the representation of a large number of well-known steamship companies and they also represent an important European airline at Karachi, Bombay and Madras.

In much the same way, insurance business was gradually built up. At present the firm hold the underwriting agencies of many insurance companies of world repute in the fire, marine, life, accident and other miscellaneous branches. They have contributed to the development of average claim settling agency business and are now acting in that capacity for a large number of insurance companies and underwriters' associations.

Windsor Industrial Corporation, Reay House, Hornby Road, Bombay

The Windsor Industrial Corporation was started in March 1938 by Dr. V. R. Heeramaneck, B.Sc. (Hons.), M.Sc., Ph.D. (Bom.), A.I.C. (Lond.), the present proprietor, with the aim of producing all types of soaps including soft soaps and curd soaps and disinfectants of quality. Since the advent of the war, a new business, viz, the manufacture of bichromate of potash has been incorporated with the older activities of the firm.

The Corporation is now on the List of Approved Contractors to the Government of India (Contracts Directorate) and has been supplying soaps and disinfectants to Bombay District Police, Port Trust and leading business houses in the country. All the products have been certified to be in accordance with the I.S.D specifications and bichromate of potash has been further approved by the Contracts Directorate and leading Indian firms.

The Corporation hopes to undertake in future the manufacture of various other chrome salts, heavy chemicals, mineral pigments, certain dyestuffs and textile accessories.

The Corporation will be glad to give suggestions on various industrial propositions. A well-equipped techno-chemical laboratory for research and analytical purposes is under construction and is expected to commence work in a short time.

CHRONOLOGY=

Note:—We have pleasure in publishing the following chronological lists in the hope that they might prove to be of reference value.

The Indian Textile Journal Chronology is of interest as indicating the vicissitudes through which it has passed and has, therefore, a necessarily limited appeal. It is another matter with the other list, although it, too, can have no pretensions to exhaustiveness or completeness. The general chronology is in no sense a comprehensive one, having been compiled mainly from the files of the Journal. Even so, it is hoped that the reader will find in it a roughly accurate picture of the principal industrial, commercial and financial trends during the last fifty years and more.

THE "INDIAN TEXTILE JOURNAL"=

1890

- Mr. S. M. Rutnagur, Founder, invents "Rutna-gur's Patent Oil Butty"
- October -First issue of the Indian Textile Journal published from Sirdar's Building, Tamarind Lane, Fort, Bombay. To be out on third Wednesday of each month. Pages: 16. Two-column page. Mr. H. Monie in charge of the Editorial Section.

- January.—Date of publication changed to last Saturday of the month.
- July —Date of publication again changed to the 22nd of every month Four more pages added as a permanent measure, bringing the total to 20.

Ornamental tail-pieces at the ends of articles removed, giving more room for letterpress.

- September.—The Journal brings out special supplement dealing with the 2,000 h.p. compound engine of Messrs. Musgrave installed at the Oriental Spinning and Manufacturing Co., Ltd.
- October .- Colour of cover page changed.
- December —The Journal removes to 27, Medows Street

- February—It is decided to preserve catalogues and other literature in the office of the Journal for the benefit of inquirers.
- October The Journal refuses to reduce advertisement rates on the ground that

it will spoil their value.

Cover changed for new volume, as usual Addition of a centimetre rule, a foot-rule and postal and telegraphic information on the cover page highly appreciated by the readers.

November -- Mr. Rutnagur starts Hindoo Sodagar.

1893

August -Mr. H. Monie retires from partner ship but continues to act as Editor of the Textile Section. Mr. John Wallace is appointed Editor of the Engineering Section.

The business is re-named M. C. Rutnagur & Co., Proprietors and Publishers, Indian Textile Journal, etc.

October.—The Journal appears with 30 pages.
Photo-zinco and electro blocks make their appearance.

January — Four more pages added as a permanent measure, bringing the total to 24.

1895

- The Management begins publication of the Directory of Indian Manufactures (Annual).
- May.—The Journal publishes Weekly Supplement and Machinery Adviser in the vernacular for the benefit of the advertisers.
- July.-M. C. Rutnagur & Co. disown any connection with Indian Textile and Engineering Reporter.
- August -- Mr. H. Monie severs connection with the Journal

Management decides on the 20th of each month. The English edition begins to appear, therefore, on the 15th of each month.

March—Reference Sheet of Indian Cotton Spinning and Weaving Mills is published for the first time in this country.

January.-Owing to the plague, the ranks of the workers in the printing press were depleted and hence there was some delay in the issue of the Journal

- January -- Business transferred to the "Indian Textile Journal Company, Lt M. C. Rutnagur & Co. as agents Ltd."
- October 27 -Mr. M C. Rutnagur, father of the Founder, passes away.
- December.—Mr. John Wallace, C.E., Joint Editor, Indian Textile Journal, is appointed Acting Principal of the Bombay School of Art

1900

March —Indian Imports and Exports Trade Journal published.

Jointly with Sir D. E. Wacha, Mr. Rutnagur founds and edits the *Municipal Journal* and Sanitary Record, Bombay.

January —Imports and Exports Trade Journal amalgamated with the Indian Textile Journal.

1903

- Mr. Rutnagur invents automatic cock for public water taps.
- Subscribers get free copies of the *Indian*Textile Journal Diary and Reference Book for 1903.
- January Messrs. Broaker and Hull, 150, Nassau Street, New York, U.S.A., are appointed Sole Agents for the Indian Textile Journal in America.
- November —Mr. John Wallace is appointed a member of the Board of the Victoria Jubilee Technical Institute, Bombay.

1904

March.—The Management issues disclaimer dissociating itself from the Indian Textile, Mechanical and Electrical News

- January.—Mr. Rutnagur publishes Men and Women of India (new monthly), said to have been the first fully illustrated social paper in India
- July —M. C. Rutnagur & Co. purchase the business of the Company including its goodwill, stock-in-trade and other property.

1907

August - The Management starts prize competitions to improve the popularity of the Journal

February — "Electricity in India' published. (It is a history of the Tata Hydro-Electric Scheme.)

1914

- January.-Vernacular Edition of the Journal is stopped.
- September —Owing to non-arrival of ship-ments from Europe on account of the European War, the Management had to change over to inferior paper.

1918

Feb.-Dec.—Publication of the Journal is delayed owing to the abnormally high cost of paper and the difficulty of exporting textile machinery from England.

- August —The office of the Journal is tempora-rily removed to Umrigar Building, Ormiston Road, Fort.
- December 15.—The Indian Textile Journal, Limited, is incorporated under the Indian Companies Act, VII of 1913.

October 9.—John Wallace, C.E., passes away. 1923

December .-- "The Indian Textile Journal, Ltd." acquires goodwill and business of Indian Industries and Power and Indian Motor News, two monthlies published from Bombay since 1903 and suspended in April 1923. 1924

-The office of the Journal is removed to Military Square, Fort, Bombay.

1927

The Management publishes Mr. Rutnagur's book, Mills.'' "Bombay Industries:

January — The Journal takes on its new cover.

1934

April - Change-over to 3-column page.

1937

- January New series Famous' begins. series: "Penalty of Being
- Julv20 ---Mr Rutnagur, Founder-Editor, passes away.

1938

- October "Textile Chemical Textile Section" opened in the Journal. Technology
- December —" Penalty of Being series comes to a close.

- June Journal begins new series "Nuts and Bolts."
- September War breaks out in Europe.
- October.—" Nuts and Bolts " series discontinued.
- November.—Owing to war conditions the size of the Journal is reduced.

1940

October .- The Journal completes its first fifty years

GENERAL

Establishment of the Bombay Chamber of Commerce.

Opening in Bombay of Pioneer Foundry and Iron Works in the Presidency by Mr. Sorabii Shapurii.

The Bombay Spinning Mill—the pioneer cotton mill in India—projected by Mr. Cowasji Nanabhoy Daver.

Transfer of Bombay Cotton Green from Elphinstone Circle to Colaba.

Inauguration of the Agency System for Bombay cotton mills.

Rapid growth in mill building in Bombay.

1861

Commencement of American Civil War.

1865

Bombay's export trade with China in yarn

begins.
American Civil War, crisis in the Bombay mill industry, with financial failures.

Better prospects for Bombay mills.

1873

Establishment of Bombay Port Trust.

Manchester pressed for repeal of duty on yarn imported into India.

Establishment of Bombay Millowners' Association.

Factory Commission appointed.

Repeal of import duty on Manchester goods.

Increase in cotton mill building in Bombay. Exports of Bombay yarns to China begin to increase.

1881

First Factory Act passed.

1884

Another Factory Commission appointed.

General introduction of ring spinning and flat cards in Bombay mills.

Formation of Native Share and Stockbrokers' Association, Bombay.

First batch of Japanese merchants come to Bombay to purchase Indian cotton.

First lot of 32 bales shipped to Japan. Establishment in Bombay of the Victoria Jubilee Technical Institute.

Foundation of the Indian Textile Journal in Bombay.

Japan begins to import Indian cotton.

October —Sassoons take over the works of the Clydesdale Dyeing Company, Bombay, for Rs 4½ lakhs.

December.—Witter Sensitive Automatic Sprinkler tested in Bombay.

January.—Textile mills in Ceylon recruit

January.—Textile mills in Ceylon recruit operatives from South India

May.—Novel automatic extinguisher for lanterns patented by Messrs. N. D. Karani and M. D. Muga of Bombay.

June.—Ingenious contrivances in the way of electric punkahs constructed at Phillips & Co., Ltd., Bombay.

July —F. W. Shallis, Bombay, patents improved balling press.

baling press.

November —Lord Reay Mills, Bombay, places trial order for two ring frames with John Hetherington and Sons.

December —Electric lights installed in Princess and Victoria Docks, Bombay.

1892

January -Bombay mills import American and

Egyptian cottons and experiment in the spinning of 40s, 50s and 60s

February—Improved Fillet Mounting Machine introduced in Indian cotton mills.

April.—Successful testing of Mr. T. R. Douse's Patent Electrical Self-Acting Fire Alarm

and Automatic Chemical Fire Extinguisher at Empress Mills, Chinchpokly

—Mr. Farlow, Mill Engineer of Greaves Cotton & Co., introduces new sprinkler

for fire-extinguishing.
Mr. R. Roscoe of Nagpur adds impor-

Mr. R. Roscoe of Nagpur adds important improvements to Dobson & Barlow's Double-acting Knife Roller Gm.

November — Maneckjee Petit Mills, Tardeo, Bombay, closed for several days owing to hot bearings.

December — Mr. Ratanshaw Dadabhoy of Sorabjee Shapurjee & Co leaves for England carrying several orders with him

Indian mints closed to the comage of silver. Introduction of aniline and alizarine dyes into Bombay mills by German manufacturers.

January — Hubli cotton market opened.

wary—Hubli cotton market opened.

rch Bombay Cotton Exchange decides
to apply for registration.

y—Experiments of the S.I.R. and the
M. & S. M R in the use of a decoction of
eucalyptus leaves as disencrustators
for locomotive boilers prove satisfactory
—Mass meeting of Bombay millhands
elects Mr. N N. Wadia to represent them
in the Legislative Council.

August.—Hindu-Muslim riots in Bombay: mills closed for eight days.

September —Bombay millands strike for increased wages.

October —Mr W. H Brady, formerly of David Mills, and Mr. J F. Bradbury, Manager of Lukhmidas Khimji and the Damodar Lakhmidas Mills, form partnership under name and style of Bradbury,

Brady & Co.

December.—Invention of an ingenious stop motion for carding engines by Mr. J.

Boon of the Soonderdas Mills, Bombay.

Import duties on Manchester goods reim-

posed

January —Mr. Mirza of Jamnagar invents improved valve motion and cut-off device steam engines. Ar. R. Roscoe

invents improved weighting device for drawing frame

Mr C C. Fouzdar, of Southern India Mills, Hubli, invents improved method of lubricating the top rollers of drawing, slubbing and like frames.

Mr Bradbury invents improved con-centric bend for revolving flat carding

engines
Mr. C N. Wadia patents corrugated shields for bobbins.

March.—New Cotton Exchange is opened at

April.—Mr J. N. Palkhiwala publishes pocket-book in (Gujerati) on calculations in carding and spinning May.—Marshall & Co., Machinery Agents and

Importers, established.

July.—Director of Land Records, Punjab, reports very favourably on certain experiments with Egyptian cotton.

January — John Wallace, Joint Editor of the Indian Textile Journal, speaks on "Ventila-tion in Cotton Mills" at the Sassoon

Mechanics' Institute.

April—Bombay Textile Club lease commodious bungalow at Chinchpokly.

December—Ahmedabad Cotton Market

Market established.

1896

Imposition of excise duty on Indian-made cloth.

Outbreak of plague in Bombay

January.—Plant and machinery arrive from England for the manufacture of bobbins

at an Ahmedabad factory.

June—Consequent upon the imposition of excise duties on manufactured cloth, several looms in the Presidency's mills stop work.

September —Lord Reay Mills replace

mules with weft ring spinning frames.

October —Mr. A. S. Narielwalla introduces

new sizing wax for cotton warps.

November —In view of famine conditions, mill agents arrange for storage of grain.

Mr Smalley, of Tweedales and Smalley, visits India

December —Several additions made to the showrooms of Greaves Cotton & Co

January — Many native merchants remove their offices from Bombay to Gujerat,

owing to plague

February—Several ginning factories in Gujerat and Kathiawar stop working owing to the closure of the Bombay mills.

March—The V. J. T. Institute, Bombay, agrees

represent the City and Guilds of the Bour to represent the City and Guilds of London Institute for the purpose of conducting examinations.

July.—Bradbury, Brady & Co. announce Crompton & Co.'s special warps for the

handloom.

Mr. N. N. Wadia leaves for England on a holiday.

usi—A company is specially formed in Bombay for weaving fine goods from imported yarns.

September —Lucknow experiments Egyptian cotton give promise of success.

The plants are covered with blossoms.

October—Thacker, Spink & Co. begin publication of the Indian and Eastern Engineer

November —Joint-stock company formed in Poona for manufacturing velvet.

December .—J. N. Tata offers to carry on sericulture in Mysore provided he is given facilities.

1898

January.—Monetary crisis in Bombay.

March.—Factory erected at Ahmedabad for calendering cloth

Egyptian cotton-growing experiments in Lahore fail.

September.—Mr. Fakirji E. Bharucha,

tember.—Mr. Fakirji E. Bharucha, Engineer of Rajnagar Mills, Ahmedabad, publishes Gujerati books on mill engines, boilers and gearings.

The question of working Bombay mills short time on account of depression is under consideration—but some mills work at night with the electric light.

October.—Commercial Mission to China pro-posed by Chambers of Commerce in the

country receive approval of the Government of India.

November — Joseph Sykes Bros. of England open Flat Mounting Department in the compound of an Ahmedabad mill.

January.—Sir D. M. Petit opens new Stock Exchange in Bombay.

Exchange in Bombay.

Messrs. C. K. Mehta and D. P. Mehta patent new Cotton Gin in Bombay.

February.—Indian Jute Manufacturers' Association decides, as an experimental measure, to run mills on short time for a period of six months.

April.—E. D. Sassoon & Co. sue Damodar Soonderdas Mills Co. for infringing their years label design

yarn label design.

August — Governor-General-in-Council empts from payment of import duty all machinery and component parts thereof, without reference to the industry for which

they are intended.

October.—Some Ahmedabad mills decide to

use American cotton.
Greaves Cotton & Co. decide to work their seven mills only on 4 days in the week.

December.—Depression in cotton trade: most

of Bombay's mills work short time

Mr. N. N. Wadia expires at Bournemouth.

Establishment of the Bombay Textile and Engineering Association

Januar 1 —Fine weaving rapidly increases in

Januar : —Fine weaving rapidly increases in Ahmedabad.

March —Plague shows signs of abatement, and famine relief work is pushed on.

April —Proposal to form a Shareholders' Association in Bombay

August.—John Wallace, C.E., Joint Editor of the Indian Textile Journal, delivers lecture on "Technical Education for India" at the J. N. Petit Institute Bombay.

Committee appointed to draw up a

Committee appointed to draw up a scheme for the R. C. T. Institute in Ahmedabad.

Anmedabad.

September.—Workers in Benares fabrics and embroidery return home after visiting the Paris Exhibition.

December.—Prof. William Ramsay of University

College, London, arrives at invitation of J. N. Tata to advise in the organization of the University of Research.

1901

January.—Bradbury, Brady & Co. start Cop Dyeing Factory at Parel, Bombay. February.—Mr C. D. Panday appointed by the Baroda Government to look after the purchase of cotton for the State Mill and as General Consulting Manager of the

as General Consuming Manager Baroda Mills.

April—Bombay Chamber of Commerce adopts rules and regulations for the measurement of goods in bales and

packages.
October.—Excitement Bombay m markets owing to the failure of several native firms.

ember—Native blacksmiths begin to make pressers for flyers of slubbing, November --- Native intermediate and roving frames.

February.—Expanding industry handicapped by dearth of labour.

Mr. P. V. Subbiah, Principal, Cawnpore Agricultural School, publishes monograph on the cultivation of long-stapled American cotton in India.

April—The Flyr-Shuttle Loom catches on in

April -The Fly-Shuttle Loom catches on in Lower Bengal.

Lower Bengal.

June.—Experimental growing of Egyptian cotton in Kathiawar successful

July.—Mr. J. C. Tosh, Manager of the Calcutta branch of Macbeth Bros. & Co., patents a process for preventing smoke.

Establishment of the Bombay Trades

Association.

September—J. N. Tata in Europe studies technical questions connected with silk weaving with a view to further developing the sericultural industry he has introduced

October —Indian yarn is shipped to
Alexandria, Marseilles and Manchester.
November —Ahmedabad Industrial Club offers
three medals for mechanical laboursaving devices.

War between China, Japan and Russia.
Exports of Bombay yarn to China begin
to fall.

February.--Movement initiated in Cawnpore to unite all mills in India and present combined petition to Parliament to repeal

combined petition to Parliament to repeal the cotton duties.

April.—Shallis and Duncan, Bombay Engineers and Machinery Importers, change name into Duncan, Stratton & Co.

May —Mill Stores Trading Co. of India, Ltd., present to the Ahmedabad Technical Institute each of the specialities of their principals.

msinute each of the specialness of their principals.

E.—Richard Marsden, Editor, Textile Mercury, dies He gave helpful advice on the establishment of the Indian Textile

Journal.

J. N. Tata lays in stocks of Peruvian cotton and offers to distribute it among

cultivators.

July.—Mysore Government sanctions opening
of weaving schools for nopularizing of weaving schools for popularizing fly-shuttle looms.

September.—Bombay Government issue new rules under Boiler Inspection Act.

October.—The Government of India appoint a commuttee to consider the question of fraudulent manufacture of short reeled yarn for sale in India.

November.—J. N Tata introduces Japanese reels into India for reeling silk.

December.—Mr Motilal K. Shah displays at Madras Exhibition several specialities including lubricants, vegetable fat substitutes, sizing wax, bleaching powders,

January.—Detailed Rules under Indian Elec-tricity Act are published. April —Association started in Bengal for

Bengal for

furthering the cause of technical education

May.—Among new inventions filed at the

Government Patents Bureau in Calcutta is
one for "treating seeds to facilitate
germination."

—Representative collection of Indian cottons sent to England for experimentation in delinting, hulling and

Superintendent of the School of Arts, Trivandrum, discovers that threads as fine as wool can be made out of areca-

nut fibre

August —The Russo-Japanese War practically
puts a stop to Bombay's trade with the
Far East.

Far East.

September—Bombay Government establish Industrial School at Pandharpur.

The Government of India set apart Rs. I lakh for the distribution of cotton seeds with a view to encouraging the production of cotton in this country.

Successful experiment at Colorita in Successful experiment at Calcutta in

decorticating fibre from aloe leaves.

October —Cawnpore manufacturers place order for bleaching and finishing plant.

They compete with Bombay.

November — Attempts to introduce French silk-worm in Burma fail and are, there-

fore, given up.

December — Attempts to introduce American cotton into Assam fail

1905

tary—Association for Scientific and Industrial Education for Indians decides to erect weaving shed containing hand-

looms from all over the world.

February —Important experiments are made in the Madras Presidency in the production of rubber and fibres.

March.—American cotton acclimatized at Cawnpore retains much of its character and length of staple but has a great attraction for insect pests

April.—A fine hand-made Lace Industry is started at Kalimpong.

May.—The Indian Industrial Association to be a second of the control of the control

May.—The Industrial Association takes up the question of introducing improved handlooms.

July.—First Indian Industrial Conference held at Nagpur under the presidency of R. N. Mudholkar.

August.—Ahmedabad builds about 12 new mills: prosperous times

Mysore Government appoint Inspectors for improving sericultural industry

in the State.

September—The Government announce their decision to have four cotton forecasts at uniform intervals of

two months

Madras Museum publishes pattern
books of design for textile manufactures.

October.—Shankar Abaji Bhise, inventor of automatic weighing machines and other mechanical devices, establishes Bhise Patents Syndicate.

November - Rapid expansion of swadeshi movement.

December.—Bombay Millowners decide to carry on work for more than 13 net working hours.

1906

ary —The Government of Madras accept Sir Alfred Chatterton's Report that it will not be advisable to spend money on

Japanese looms.
Establishment of the Swadeshi Cooperative Stores Co., Ltd., Bombay, for
doing business in swadeshi goods.
uary.—Government of Bombay publish
valuable report on botanical classification
of Indian cottens

February.-

of Indian cottons.

Among novelties of the Indian Cycle and General Engineering Co., Bangalore, exhibited at Mysore Exhibition, is a $7\frac{1}{2}$ h.p. two-cylinder three-seated motor March -Tata Scheme for manufacturing iron ch—Tata Scheme for manuacturing from and steel in India becomes a reality. Col Stoddart, Chairman of Parkgate Iron and Steel Co, and Mr Selkirk, eminent Mining Engineer, visit the ore

mines at Gurumaisini.

April—The British Cotton Growing Association makes annual grant, for four years, of £2,500 for the improvement and extension of cotton growing in India.

extension of cotton growing in India.

May — Egyptian cotton growing in Sind is highly successful
Indian Bobbin Manufacturing Co., Ltd, started in Surat with a capital of Rs 75,000 Agents. Mangalbhai & Co

June. — Government of Madras decide to establish first Government Handloom Factory at Salem

As a consequence of frequent mill fires, Bombay fire insurance companies raise rates.

Manager of Bangalore Woollen and

Cotton Mills makes the interesting experi-

cotton Mills makes the interesting experiment of giving elementary education to juvenile operatives.

The Millowners' Association, Bombay, addresses the Bombay Chamber of Commerce and the Bombay Trades Association in the matter of making joint representations to Government for a Commission to inquire into the adulteration and deteriors for the particular pattern.

tion and deterioration of Indian cotton.

ust.—The Bombay Electric Supply and
Transport Co., Ltd., decides to oppose
the grant of licence to Tata and Sons

September.—Claims of economical working by Diesel engines borne out by the experience of the Buckingham Mills in Madras.

October—Circular addressed to Bombay millowners calling their attention to the importance of giving greater commercial opportunities to Indian graduates or

opportunities to Indian graduates or under-graduates. ember.—Government pass resolution that legislation is not the remedy for mixing and other malpractices in the cotton trade. December .-

Indian Merchants' Chamber, Bombay, established.

The Finlay Mill—the first complete electrically-driven cotton mill in India started in Bombay by James Finlay & Co, Ltd.

Ltd.

January.—The Factory Labour Committee commences its work in Bombay.

February.—H. M. the Amir of Afghanistan, when on a visit to the Indian Exhibition at Calcutta, takes particular interest in the yarns and cloths manufactured by the Petit Mills of Bombay.

The Factory Labour Committee inspects Madras mills and thinks that, on the whole, they are superior to the mills in Bombay.

March.—400 acres added to the Bombay Government experimental stations at Surat and Dharwar for the special cultivation of improved cottons.

tion of improved cottons.

April.—Bombay spinning mills decide to work short time to reduce large unsold stocks of yarn in the China market. They decide to close the mills on three days in the week.

May —Government of Mysore decide to hold annual Industrial and Agricultural Exhibition during the October Dasara festivities.

July.—The Secretary of State for India formally sanctions the establishment of the Central

Weaving School at Serampore, Bengal

August.—G L Mullick & Co., Calcutta, offers
to supply 5 and 10 seer bags of Egyptian
cotton seeds to those who are interested.

cotton seeds to those who are interested.

September — Native cotton merchants of Bombay take an oath to boycott a British firm because its principal treated with disrespect an assistant from a native firm.

October — The Director-General of Commercial Intelligence, Calcutta, receives numerous inquiries from firms in Europe for Indian varies of various requires and

for Indian yarns of various counts and descriptions.

1908

February.—Industrial and Economic Survey of

Baroda State.

June —Factory Commission Report forwarded to the Secretary of State for India: minute of dissent by V. D. Thackersey and minority report by T. M. Nair.

August - The Government of India decide that leather endless ropes for power-driven machinery shall be free of customs duty.
The Combatore Agricultural College

formally opened by Mr. E. Couchman.

December —Viceroy opens Imperial Agricultural Research Institute at Pusa.

1909

New Factory Act passed

February—Establishment of the Economic
and Statistical Society of Western India.
Hon. Secretaries Sir Stanley Reed and
Sir Lallubhai Samaldas.

Madras Government appoint expert
committee to investigate into the possibilities of chemical industries in that

Province.

March - Proposals for the cultivation of long-

stapled cotton in the Punjab.

October—It is proposed to sell Egyptian cotton grown in Sind in London directly through the agency of the British Cotton

Growing Association
The cultivation of jute in Poona District proves a failure though it is a success on the Government farm at Dharwar.

November —Sir M Visveswarayya, of the Bombay Engineering Service, is appointed Chief Engineer to the Government of Mysore.

December (30) —The first flight by a flying

machine at Calcutta.

Tata Hydro-Electric Power Supply Co. registered

January—10,000 bales of Indian cotton are

shipped to the United States of America.
February.—The Tata Silk Farm in Bangalore is

taken over by the Salvation Army in India.

Mai ch — The Government of Madras announce grants to the Chengalvaroya Naicker Technical Institute as an encouragement

Technical Institute as an encouragement to technical education in that Province May.—Edward VII passes away and is succeeded by George V.

June.—The Caxton Printing Press, Bombay, removes to new quarters, "Caxton House," Frere Road, Bombay.

A meeting of the Native Cotton Exchange at Colaba decides against establishing a "Clearing House."

September—The Government of India decline to check the practice of Indians trading under European names

under European names

New Patents and Designs Act for India

New Patents and Designs Act for India comes into force.

January.—H M. the Amir of Afghanistan sanctions a hydro-electric scheme for electric driving in the mills of Kabul Indian Electricity Act comes into force.

July —W. Coombes' article on "Madras Dyeing" appears in Journal of Dyers and Colourists

August.—The Government of Bombay draft Smoke Niusance Bill.

A meeting of the Bombay millhands approves of the Elementary Education Bill introduced in the Indian Legislative Council by Mr. G K. Gokhale.

Mr. K. M Master publishes a book in Gujarati on "Single Roller Cotton Gins" September.—The Secretary of State sanctions modified scheme proposed by the Government for the establishment of a Technological Institute at Cawnpore.

December (2).—King George V arrives in Bombay.

Bombay.

His Majesty the King agrees that the Institute of Science in Bombay should be known as the "Royal Institute of Science."

Januar y.—Bradbury, Brady & Co. is dissolved.
Mr. W H. Brady commences business
under name and style of W. H. Brady

& Co.

March—The Government of Madras appoint Committee to report upon the improve-ment of technical and industrial education.

May—The Government of India grants Rs. 2
lakhs to the Victoria Jubilee Technical
Institute, Bombay.

June—The Bombay Smoke Nuisances Abate-

ment Bill receives Viceroy's assent.

The Committee appointed in 1911 to consider the question of ventilation of textile factories submits report to the Government of Bombay.

The Governor of Bombay receives very generous support in the matter of establishing a Government College of

Commerce.

October —Salvation Army organizes Industrial Exhibition in Bombay.

November —Boom in Cotton mill shares.

Social Service League, Bombay, commences welfare work for mill operatives

Januar y—W. T Henleys open branch office at Hamam Street, Bombay.

The Government of India draft Bill for

suppressing gambling in cotton in Bengal. April—A company is formed in Bombay with the object of handling the transport of cotton, coal, iron, machinery, and other heavy goods

May—More than 50 per cent of Bombay
City's cotton mills are without the supervision of executive partners of their managing agency firms they are away

on the Continent on a holiday.

June—W. H. Brady & Co. is registered as a joint-stock company. Mr. W. H. Brady is the Managing Director, and Mr. J. A. Kay and Mr. H. H. Lakin are ordinary

the Government of Bombay appoint a Committee of Inquiry into the education of factory children (including cotton

mills).

August —The Government of Bombay appoint
Sir Phirozesha Mehta and Mr. John
Wallace, C.E., to be members of the
Committee of Direction for Technical Education.

September — Mr. G. K. Devadhar outlines an interesting scheme for the formation of co-operative credit societies for mill-

October — D. T. Chadwick's Report on Cotton Improvement in the Madras Presidency

Improvement in the Madras Presidency published.

November — The High Court of Bombay decides what parts of a cotton mill machinery come under the category of movable property and what not.

December — Beginning made in Bihar with the cultivation of flax

Commencement of the Great War.

Stoppage of mill building in Bombay.

January.—Ramsay Macdonald lands in Bombay

and visits mill labourers' chawls

February —American cotton grown experimentally in Sind fetches Rs. 12 per maund compared with Rs. 7 for Sind cotton.

April —The Directors of the Kohmoor Mills,

Rombay proposed to grow

Bombay, propose to start a provident fund for the benefit of their employees.

The Mysore Silk Association is established.

June — The opening of Simplex Mill in Bombay
—the first cotton mill in India to be
electrically driven throughout by current
from a central power station.

The Government of Madras establish a

Department of Industries. Central Government of Bombay refer to the Central Government a scheme for the provision at Bombay of a central institution for the teaching of science, called "The Royal Science Institution."

August.—The piecegoods market in Bombay is favourably affected by the declaration

of war
September —The Director of Commercial Intelligence institutes inquiry into (a) to what extent Indian products hitherto exported to Germany and Austria are likely to be taken to other countries and (b) the possibility of establishing in India industries for the manufacture of articles hitherto imported from Germany and Austria Austria.

October.—Cotton textile mills handicapped for want of stores, particularly in the bleaching and dyeing departments.

November — Export of raw wool prohibited by order of the Governor-General-in-

Council.

January.—As an experimental measure, Mr. M. S. Gubbay, I C.S., Collector of Customs, Bombay, is deputed on special duty as Indian Trade Commissioner to the Board of Trade in England.

March.—Complete stoppage of imports of glazed coloured paper on which is stamped the yarn and cloth labels of Indian mills.

May.—The Government of India issue orders

prohibiting the export of raw cotton.

August.—Bombay millowners decide to manufacture blankets and other coarse goods

from cotton waste.

September—Royal Proclamation is issued declaring raw cotton, cotton lint, cotton waste and cotton yarns absolute contraband.

October—The electric drive in the mills under the agency of Bradbury & Co. prove remunerative.

prove remunerative.

November.—Conference between the Indian Merchants' Chamber, Bombay, and Mr. Findlay Shirras, Director of Statistics, regarding questions relating to crop statistics and forecasts.

December.—The Rombay Cotton Trada-

December — The Bombay Cotton Trade
Association offers Rs 22,500 for the
purchase of an aeroplane or a motor
ambulance by the British Government.

February —Pusa experiments on the manufacture of starch in India.

Prof Jevons of Allahabad University arranges to edit and publish the Journal

of Indian Economics.

Prof. J. A. Todd delivers a course of three lectures at the Sydenham College of Commerce, Bombay, on "The Cotton Trade" Trade

March.—Mr. J. F. Bradbury dies.

June —Sir Thomas Holland is appointed

President of the Indian Industrial Com-

rresident of the Indian Industrial Commission and Sir Robert Bell its Secretary.

September — As there is no Cotton Exchange in Karachi, 45 cotton brokers, doing business in the street are arrested by the police for obstruction but are discharged by the Magistrate.

November.—Madras Trades School opened.

At an auction sale in Colaba in connection with the Great War, 224 bales of raw cotton fetch Rs. $1\frac{1}{2}$ lakhs.

January — The foundation-stone is laid of the new building of the Victoria Jubilee Technical Institute at Matunga, Bombay.

February — Edward Sassoon and Meyer Sassoon Mills of Bombay erect new weaving sheds of 1,000 looms each, in view of the new markets operad by the way for

the new markets opened by the war for their cloth manufactures.

March.—Conference of Chambers of Commerce in India to discuss the problems which are sure to arise after the terminature of the more

tion of the war.

May.—New Stock Exchange opened in

Bombay.

June.—Long-staple cotton engages the special attention of the Government of India.

Mr. Boyce, I.C.S., is placed on special

Mr. Boyce, 1.C.S., duty.

September.—Mr. D. T. Chadwick, I.C.S., assumes charge of the office of the first Indian Trade Commissioner in London.

October.—Bombay millhands demand cost price shops.

Sir Thomas Ainscough is appointed Senior Trade Commissioner for His

End of Great War. Tata Sons Workmen's Institute and Currim-bhoy Ibrahim Workmen's Institute started.

Formation of the Bombay European Textile Association.

Textile Association.
Formation of Ginn Kamgar Sangh, Bombay.
January.—Morarjee Goculdas Mills, Bombay,
build chawls for their operatives as an
experimental measure.

May—Mr. (Now Sir) Gilbert Wiles, Chairman,
Cotton Contracts Board, prepares scheme
for a now Cotton Fachange in Bombay.

for a new Cotton Exchange in Bombay. September.—Bombay Millowners desire adopt the ten-hour working day.

April—Seth Jamnabhai Mansukhbhai introduces creche in his Ahmedabad mill
G. Claridge & Co becomes joint-stock company with W. H. Brady & Co. as Managing Agents.

Mr. H. Greaves of Greaves Cotton & Co. makes gift of Rs. 25,000 to the Sydenham College of Commerce, Sydenham Bombay

Mar.—Bombay Millowners memorialize
H E. the Viceroy to amend Section 28 of
the Factories Act in order to reduce the

number of working hours from 12 to 10.
Sir Fazalbhoy Curimbhoy leaves to represent India at the International Econo-

mic Conference at Brussels.

June—Sir Vithaldas D Thackersey, wealthy
Bhatia millowner of Bombay, gives Rs. 15
lakhs to the Indian Women's University.

August.—A company is formed in Calcutta for assembling motor cars and building car bodies in India.

The Government of India accumulate

large stocks of piecegoods surplus to requirements and express desire to find

markets for them. September —Handloom Weavers' Union is

Regarding the Bombay Government's scheme for the housing of the working classes, the Government of India have decided to advance Rs. 1 crore.

October—The Government of Bombay announce that 60-70 tons of repatriation aniline dyes are available for distribution.

November.—The Government of Bombay appoint Mr. J. D. F. Engel as Inspector of Cotton Excise

Cotton Excise.

1921

January—Levy of town duty on all raw cotton imported into the city of Bombay by sea or land from any part of India at the rate of Re. 1 per bale, averaging approximate-

of Re. 1 per bale, averaging approximately 3½ cwts.

Bombay Factory Inspection Department and the Boiler and Smoke Nuisances Department are amalgamated.

April—Herbert R. Greaves expires at Monte Carlo on 18-4-1921.

7.—French Consul in Bombay proposes the establishment of a French Chamber

of Commerce in Bombay.
Mr. (now Sir) Bryce C. Burt, Deputy
Director of Agriculture in U.P., is appointed whole-time Secretary of the
Indian Central Cotton Committee.

.—Orders for textile machinery from India give fillip to the Lancashire en-

India give fillip to the Lancashire engineering industry.

August — Morarjee Gokuldas Mills construct large dye works at Parel.

Mr G. W. Burley, Lecturer in Mechanical Engineering, University of Sheffield, is appointed Head of the Mechanical Engineering Department of the Victoria Jubilee Technical Institute, Bombay.

The Government of Bombay appoint Mr. T. Maloney, Adviser on Humidification with the Government of India, as Inspector of Factories.

of Factories.

October — The personnel of the Indian Fiscal Commission is announced.

November: — The Bombay Cotton Contracts Control Act, passed in 1919, is repealed.

December — The Calico Printers' Association, England, send special representative to India to investigate the possibilities of Calico printing in India.

Calico printing in India.
Mr F. E. Bharucha, Assistant Director of Industries, Bombay arranges for trials of a new type of silk twisting machine designed by Mr. T. S. Dawson, Principal of the V.J T. Institute.

Establishment of the East India Cotton Associa-

tion, Ltd.
Indian Factories Act amended.

Social Service League, Bombay, opens Work-ing Men's Institute

February.—It is proposed to increase the countervailing excise duty on the products of Indian cotton mills from 3½ to 7½ per cent and a similar increase takes place in the ad valorem duty on imported

cotton goods.

The Calico Printers' Association of Lancashire open permanent office and showrooms in Bombay.

March—The Indian Central Cotton Committee

plans for the general improvement of cotton cultivation throughout India. I.—The area under cotton gradually expands; it increases by 50 per cent. between 1895 and 1920.

May —Sir T Vijayaraghavacharıar ıs appointed Commissioner for India at the Wembley Exhibition.

Mr. D. T. Chadwick resigns Indian Trade Commissionership in London to take up the post of Secretary, Commerce Department, Government of India. Mr.

H. A. F. Lindsay takes his place.

—The Visvesvaravva Comm —The Visvesvarayya Committee on Industrial and Technical Education in

Bombay submits its report.

August.—The Holkar of Indore appoints a
Registrar of Cotton Contracts before
whom all cotton dealings, forward as well

as delivery, have to be registered.

September—The Commercial Agent to the German Consul-General opens office in Calcutta to provide information and facilities to those doing business with Germany

Germany.

To facilitate preparatory processes and to improve the quality of the silk yarn, machines for spinning, reeling and twisting are improvised at the Government Weaving Institute, Serampore

The Report of the Indian Fiscal Commission is published

October —It is proposed to establish a Technological Institute at Cawnpore named after Sir Harcourt Butler, Governor o establish a at Cawnpore of the United Provinces.

November.—An improved silk machine is introduced in Gujarat. silk reeling

The Bombay Legislative Council passes the Cotton Contracts Act which empowers the East India Cotton Association, Ltd., to frame by-laws for the regulation and control of transactions in cotton subject to the sanction of the Governor-in-Council.

December —Picketing of foreign cloth shops in Ahmedabad

Ahmedabad millowners decide to reduce wages

The Madras Legislative Council passes the State Aid to Industries Bill

Indian Cotton Cess Act passed.
The Millowners' Association, Bombay, separate from Bombay Chamber of Commerce and establish their own organization.

Bombay millowners demand repeal of Excise Duty.

Bombay Millowners' Mutual Insurance Association, Ltd., started. Establishment of Indian

Committee.

The Government of India decide to add four representatives of cotton growers in the Central Provinces, the United Provinces, the Punjab and Madras to the list of members of the Indian Central

Cotton Committee

February — The Council of State passes Sir
D. E. Wacha's resolution recommending
a census of production

March.—Mr T. Maloney is appointed Technical Secretary of the Millowners' Association

tion, Bombay.

The Millowners' Association, Bombay, collect one lakh of rupees for the Victoria Jubilee d'echnical Institute, Bombay

Bombay Governor opens new Mazagon

Cotton Depots.

/—Lord Willingdon lays foundation-stone of new Trades School in Madras. Mill strike in Ahmedabad.

—For preventing the introduction of the American boll-weevil, the Madras and Bombay Chambers of Commerce approve of the proposal to restrict the importation of American cotton into Bombay Port August —Mr. Bryce C. Burt is apport

ust —Mr. Bryce C. Burt is appointed Secretary of the Indian Central Cotton Committee.

Overstocked Bombay mills discuss

Short-time working.

October.—The Bombay cotton trade congratulates Sir Purshotamdas Thakurdas on the Knighthood conferred on him

November.—Bombay Governor opens new building of the Victoria Jubilee Technical Institute at Matunga
Prof. A J. Turner, M.A. (Cantab.),

Prof. A J. Turner, M.A. Commun., B Sc. (London), Professor of Textile Technology in the Manchester University, is appointed Director of the Indian Central Cotton Committee's Technological Laboratory.

December —Mr. Pestonji D Patel is elected Member of New York Cotton Exchange: first Indian Member to be so elected.

January —Bombay cotton mill strike.

April —The Commercial Bulletin is published monthly by H M 's Senior Trade Commissioner in India.

The Government of Bombay decide to make a start with the Safety First Cam-

May—A proposal is put forward for the

May—A proposal is put forward for the manufacture of artificial silk in Bombay.

June—The Viceroy gives his assent to the Steel Industry Protection Bill.

September.—A mass meeting is held in Bombay to protest against the Cotton Excise Duty

The services of Sir Frank Noyce, Development Secretary, Madras, are placed at the disposal of the Government

Opening of New Cotton Exchange Building in

Bombay.
Workmen's Compensation Act comes into force

February—The Golden Jubilee of the Mill-

owners' Association, Bombay.

March.—The Government of Bombay introduce demonstration parties for popular-izing handloom weaving.

ust —The establishment of the Indian Textile Association, Bombay

Textule Association, Bombay
A joint deputation of the millowners of
Ahmedabad and Bombay wait on the
Viceroy praying for the repeal or suspension of the Cotton Excise Duty.

September—General strike in Bombay mills.

October—A glycerine plant is installed in the
Kerala Soap Institute, Calicut.

December—The Cotton Excise Duty is

Duty 1s December —The Cotton Excise

The strike in Bombay mills ends.

1926

Bombay Textile Labour Union is established Opening of Nowrosjee Wadia Maternity Hospital in Bombay for mill operatives. Toyo Podar Mills, the first Indo-Japanese mill

started in Bombay

March—The millowners of Bombay are perturbed over Japanese competition.

June—In response to the representations of the Bombay Millowners, the Government of India appoint a Tariff Board to inquire into the condition of the cotton textile

industry in India.

July —The Bombay Millowners submit their case to the Tariff Board.

September.—Britain is losing her trade with

India in cotton manufactures to Japan and Italy and her machinery trade with this country is slipping to Germany and Belgium.

January -- The Textile Tariff Board complete their labours.

- Government reject the recommenda-tions of the Textile Tariff Board. Mill-owners of the country assembled in con-

ference at Bombay protest.

—Conversations between July.—Conversations millowners and Government representatives on the

question of adequate protection.

August —Government revise their decision

August — Government revise their decision regarding the recommendations of the Textile Tariff Board.

September — The Indian Legislature passes the Yarn Protection Bill.

December — Japanese Trade Mission arrives in India Bombay millowners give banquet to Lord Irvine.

1928

January - The Government of India send

January—The Government of India send textile mission to Africa and the Near East to survey their potentialities as markets for Indian goods

February—Sir Ness Wadia and Sir Cusrow Wadia give Rs. 22 lakhs for the children's hospital, the "Bai Jerbai Wadia Hospital" in Parel.

April — General strike in Bombay mills.
July — Indian Textile Trade Mission returns July home

October.—General strike in Bombay mills ends after $5\frac{1}{2}$ months.

Fawcett Committee of Inquiry is ap-

pointed.

December.—The Report of the Textile Trade
Mission is published.

February -- Fawcett Committee finishes its

February—Fawcett Committee Innisites its labours

June—Chaos in Bombay's textile industry.

July—Mill strike situation does not improve.

Bombay Government appoint Court of Inquiry under the Trades Disputes Act, consisting of Mr Justice Pearson, Mr. F S.

Talyarkhan and Mr. Rupchand Bilaram.

Strike.—Bombay mull strike ends: operatives return to work. The Riot Committee and the Strike Inquiry Committee publish their reports.

reports.

October — The Royal Commission on Indian
Labour (Whitley Commission) commences

its work.

ember—Mr. Hardy's Report on the substitution of specific duties for ad valorem duties on cotton goods is pub-December lished

February —Government sanction increased February —Government sanction increased revenue duty on imported cotton goods from 11 to 15 per cent. and a protective duty of 5 per cent. more on cotton goods from outside the United Kingdom.

March.—The Indian Legislative Assembly passes Cotton Tariff Bill.

July —The Bombay Banking Inquiry Committee submits its report.

October.—Society ladies open swadeshi cloth shop in Churchgate Street, Bombay.

November —Bombay millowners issue their warranty labels in Gujarati and English.

December.—Sir B. N. Mitra is appointed High Commissioner for India in England.

January.—The Viceroy lays foundation-stone of the headquarters of the Institution of Engineers (India) at Calcutta.

March —Dr. Nazir Ahmad is appointed Director of the I.C.C.C.'s Technological Laboratory at Matunga, Bombay.

April (2)—Mr. W. H. Brady passes away in North Wales.

1932

July.—The Government of India accept the Tariff Board Report recommending in-creased duty on foreign cotton piece-

goods.

September — The Bombay Legislative Council passes the Cotton Contracts Bill.

1933

Mav.—Labour Commissioner's

Bombay comes into existence.

June — Chemical Engineering and Technology
Course is opened at the Tata Institute of Science at Bangalore.

pril.—General strike again in Bombay mills uly.—The Indo-Japanese Trade Agreement

April.—Children Indo-Japanese IIIIII is signed.

August —Dr. D. B. Meek succeeds Sir Harry Lindsay as India's Trade Commissioner London.

Government ap-

point a Board of Sericulture.

1935

July —The mills in Ahmedabad adopt the "Relay System" to make up for the fall in

production.

September — The Government of India appoint Special Tariff Board for the cotton textile industry.

July —The Special Tariff Board submits report. 1937

-Indian Trade Agent opens office at October .-

October.—Indian Trade Agent opens omice at Kabul, Afghanistan

November — Special Inquiry into minor industries by Mr. R. K. Nehru is suspended.

December.—Mr. Harold Butler, Director, International Labour Organisation, Geneva arrives in Madras on a tour of Geneva, arrives in Madras on a tour of India.

January — Sir Muhammad Zafarullah sails for England to resume trade negotiations

with that country.

H. S Malik, India's Trade Commissioner in the United States of America, sails for New York.

—Sericulture Tariff Board meets in

September.—The Bombay Legisl sembly passes the Cotton G
Pressing Factories Act.
Indian Government Trade Bombay Legislative Ases the Cotton Ginning and

sioner opens office in New York

October—The Government of the United
Provinces establish Bureau of Economic

Intelligence ember—The personnel is announced of the National Planning Committee presided over by Mr. Subash Chandra Bose.

December.—Several mills in Bombay dividually appoint their own labour officers.

1939

January -- The Sericulture Tariff Board finishes its work and submits report.

September—Declaration of war on Germany

by the Allies.

ber—The Economic Resources Board is created by the Government of India.

November.—Bombay Industrial Court, appointed under the Bombay Industrial Disputes Act, 1939, frames rules of procedure and standing orders for mills.

January —Bombay mills place on market new type of sandbag made of cotton waste.

March —Dearness allowance dispute and general strike in Bombay's cotton mills.

Government of India release for publication the report of the Sericulture Tariff Board, but introduce Bill in Central Assembly continuing the present duty for a period of two years more.

April —The general strike is called off.

The Bombay Industrial Court gives its award in the dearness allowance dispute between the Ahmedabad millowners and their employees.

their employees.
Japanese Export Quota provisionally raised, pending the conclusion of another Protocol.

May — "Cotton-jute union" fabric evolved.

Bombay Industrial and Economic Bombay Industrial and Econol Survey Committee submits report

Survey Committee submits report to Government.

Ordinance passed restricting imports of 67 commodities into India.

—Opening of Karachi Cotton Exchange, second in India.

Appointment of Gregory-Meek Delegation to America.

gation to America

—An Ordinance is passed empowering the compulsory recruitment of technicians

for national service

"ust — Government invite tenders for the purchase of the assets of Chemdyes Ltd Export Advisory Committees at ports appointed

appointed

September — War Risks Insurance Ordinance.

October. — H. H. The Maharaja Scindia of

Gwalior makes a free gift of the Hattersley

Mills, Bombay, manufacturing webbing

cloth, to Britain.

Eastern Group Conference opened at

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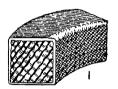
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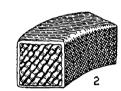
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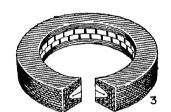
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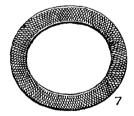


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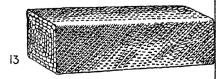
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